THE

Malayan Agricultural Journal.

FEBRUARY, 1934.

EDITORIAL.

Agriculture in Netherlands India.

In the present number of this journal, prominence is given to an abstract of a recent publication—" The Export Crops of Netherlands India in 1932 ". Abstracting this bulletin at such length is justified for several reasons. In the first place, Malaya cannot afford to ignore the importance of a country which can claim to satisfy, to the following extent, the world's demand for a number of important products such as rubber 29 per cent., sugar 11 per cent., tea 18 per cent., cinchona 93 per cent., copra 29 per cent., sisal 29 per cent., kapok 79 per cent., and pepper 75 per cent.

Secondly, the publication is an excellent review of the agricultural enterprise—both as large scale production and on small holdings—in the country to which it refers. With the increasing diversification of agriculture in Malaya, reliable knowledge of what is being successfully accomplished in Netherlands India cannot but prove of great value. We also venture to predict that the many readers of the *Malayan Agricultural Journal* in countries outside Malaya will find this abstract of interest and value.

It is regretted that it has been impossible to print the abstract as submitted for publication, owing to limitations of space in the journal. The reader will, however, with the aid of the abstract, be able to consult the original bulletin—which is in the Dutch language—with ease and to abstract for himself more detailed figures than are here given, and to refer to many other crops of perhaps less importance in Malayan agriculture, than are treated in the abstract.

No attempt is here made to convert figures of metric weights and areas into English equivalents. At the end of the abstract, however, will be found a conversion table, by the use of which the reader will be able to convert such figures for any crop as he may desire.

Attention must again be drawn to the original publication, which is a mine of information. It demonstrates the diversity and value of agricultural enterprise in Netherlands India, which places the welfare of the people of that country in an impregnable position, minimising the effect of low market prices by alternative sources of livelihood and rendering them more self-reliant in the matter of satisfying domestic needs from local resources.

Fruit Propagation. The accusing finger is often levelled at the poor quality of fruit grown in Malaya. It is pointed out that supplies are uncertain and that the quality of many varieties is irregular and very frequently, inferior to the produce of other countries.

Scientific improvement is necessarily slow, owing to the length of time which must elapse by reason of the fact that most fruit trees take many years to reach maturity. Practical improvement is retarded because of the conditions under which fruit is usually grown in Malaya. The bulk of supplies originate from small holdings where, more frequently than not, trees of widely dissimilar nature are mixed and where effective selection of stock is generally entirely neglected.

The solution of these problems leads us along many avenues of research. Not only have we to carry out scientific work on the improvement of stock, but to ensure that by improved planting methods and education, the native may take full advantage of any superior varieties of fruit trees that are evolved.

While the organisation for the latter desideratum is not being overlooked, attention is being given to a study of existing fruits and steps are being taken towards their improvement by selection and other methods. An article on "The Propagation of Fruit Trees by the Etiolation Method", which is included in this number, describes the adaptation of the etiolation method to local conditions and its use and value in perpetuating desirable qualities in a number of local fruits.

The possibility of employing vegetative propagation over a wider range of fruit trees is receiving attention and will result in more planting material becoming available of trees which can be guaranteed to reproduce faithfully the good qualities of the parent stock.

Storage of Oil Cakes. One of the early results of the recent imposition of duties on various edible oils imported into Malaya, and of a smaller duty on the import of the raw material from which such oils are expressed, has been considerably increased activity in the local production of such oils. In particular, this applies to coconut and groundnut oils.

One of the main difficulties regarding local oil production has been the disposal of the residual cake—used for cattle food—in good condition. An article on the "Storage of Oil Cakes" in the present number records the results of an investigation on this subject.

The writer shews that while there are only small changes in the oil content in storage, there is an increase in acidity of the oil, except in the case of the by-product from the milling of parboiled rice.

A marked increase of acidity will affect both the palatability and digestibility of the oil cake. It is suggested, therefore, that it is preferable to rely upon purchases in small quantities at frequent intervals and where possible to purchase direct from the oil mill, in order that the material may be as fresh as possible.

As regards rice milling by-products, it is shewn that the parboiled products are superior to the white rice products, even though the colour of the latter, particularly the polishings, may be more attractive.

Original Articles.

THE PROPAGATION OF FRUIT TREES

BY

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Introductory.

The propagation of fruit trees by what has been described as the "etiolation method" is new to Malaya, but has been in use for some years at the East Malling Research Station, Kent, England. The method was evolved some years ago for the purpose of propagating deciduous fruit trees. The reason for adopting the method was due to the fact that it had long been apparent that stocks on which fruit trees were grafted could not be relied upon to behave uniformly, the consequence being variation in vigour and fruitfulness of resulting trees. Stocks for certain purposes were raised from seed, while for other purposes vegetatively produced stocks were used. There was always considerable variation in the performance of seedling stocks and those produced by vegetative means were not found to be much better in this respect. Consequently, some method by which clones of stocks which would give a uniform performance could be propagated vegetatively was necessary.

It was early apparent that certain desirable fruit tree stocks were not easily rooted by ordinary methods and the etiolation method, which is a modification of layering, was brought into use and has proved successful for the purpose of raising apple, plum and cherry stocks.

A visit was paid to East Malling by Mr. J. N. Milsum while he was on leave in 1931-32, and on his return to Malaya, experiments were commenced with a view to propagating tropical plants such as tea, coffee, and fruit trees, by this method. The success so far attained in the propagation of tea has been published recently, and in the present article it is proposed to give the results so far attained with the propagation of fruit trees by this method.

Methods of Propagation.

Fruit trees have been propagated by vegetative means from very early times and these methods include grafting, budding, cuttings, layering and marcottage. The methods of grafting and budding have for their object the building up of a tree from two different plants, *i.e.* the stock or rooting portion and the scion or portion grafted or budded upon the stock. The influence which the stock has upon the scion makes it desirable that the former should show as little variation as possible so that, with experience, the performance of any particular tree grown upon it can be judged, within narrow limits. This can

only be attained by raising stocks by vegetative means. Considerable investigation is necessary, however, before these methods can be adopted for tropical fruit trees.

The propagation of certain fruit trees by means of cuttings and marcottage with the object of producing trees growing upon their own roots is well known in Malaya. Before the method of propagation about to be described can be carried out, it is necessary to use these methods, more especially marcottage, for the production of plants for laying down in etiolation beds.

It is a well known fact that the seedlings of most fruit trees vary considerably, both in the quality and quantity of fruits produced; therefore, if trees having the desirable characters of the parent are to be raised, vegetative methods of reproduction are desirable. Indeed, for certain fruits such as the seedless orange, or the pomelo, it is the only possible method of reproduction. Another advantage to be derived from the vegetative propagation of fruit trees is early maturity. Fruit trees produced by marcottage bear fruits earlier than seedlings of the same species.

The method of propagation used at East Malling has been recently described by Milsum and Marsh and is as follows :—

" The plants required to be propagated are planted in rows each plant being placed obliquely in the soil at an angle of 35° to the horizontal. When sufficiently established, the young trees are laid and pegged down in shallow trenches a few inches below the ground level. As shoots appear from the stem and lateral branches, an inch or so of soil is placed over the entire tree, the growing shoots have thus to ascend through a layer of soil. As growth proceeds, further soil is added until a layer of earth 4—6 inches in depth covers the base of the shoots. The portion of the stem below the soil receives no light and becomes etiolated. This condition is favourable to rooting which occurs freely in the blanched portion of the stem of the shoot below the soil."

It was early apparent that certain modifications of the above procedure would be necessary locally owing to the fact that the plants to be dealt with are evergreen and nearly always in a state of active growth. The temperate fruit trees on which this method of propagation is carried out at East Malling are deciduous and are pegged down in winter when the trees are dormant. The return to active growth in the spring results in the production of vigorous shoots which easily push through the soil. It was found that when certain tropical fruit trees were treated in this way, the branches died back; it was therefore necessary to modify the above procedure.

The Methods adopted at the Central Experiment Station, Serdang.

As stated above, it is necessary in the first place to procure marcots of the fruit trees which it is desired to propagate. To accomplish this a suitable branch with firm, well-ripened wood, is selected. A ring of bark 1—1½ inches wide is removed from just below a node and to this is applied a compost of

leaf mould, soil, sand, and cattle droppings mixed together and moistened so that it can be pressed into a ball. This is secured to the branch with a wrapping of coconut fibre tied tightly with wire, twine or other tying material that will last for a few months under moist conditions. The ball of soil is kept moist until the marcot has produced sufficient roots, when it may be removed from the tree. The time taken for roots to appear varies with different species of fruit trees but with the majority, from two to four months is necessary before the marcot is sufficiently well rooted. It is advisable not to cut the marcots from the tree too soon after roots first appear through the fibre, for, with some trees, such as the rambutan, marcots are difficult to establish unless they are well rooted.

Having removed the marcot from the tree, it should either be planted directly into the etiolation beds or temporarily established in pots. The latter procedure is the more satisfactory for such trees as the rambutan and chiku, owing to the fact that a large number of casualties are liable to occur unless the marcots are given careful attention until they are thoroughly well rooted.

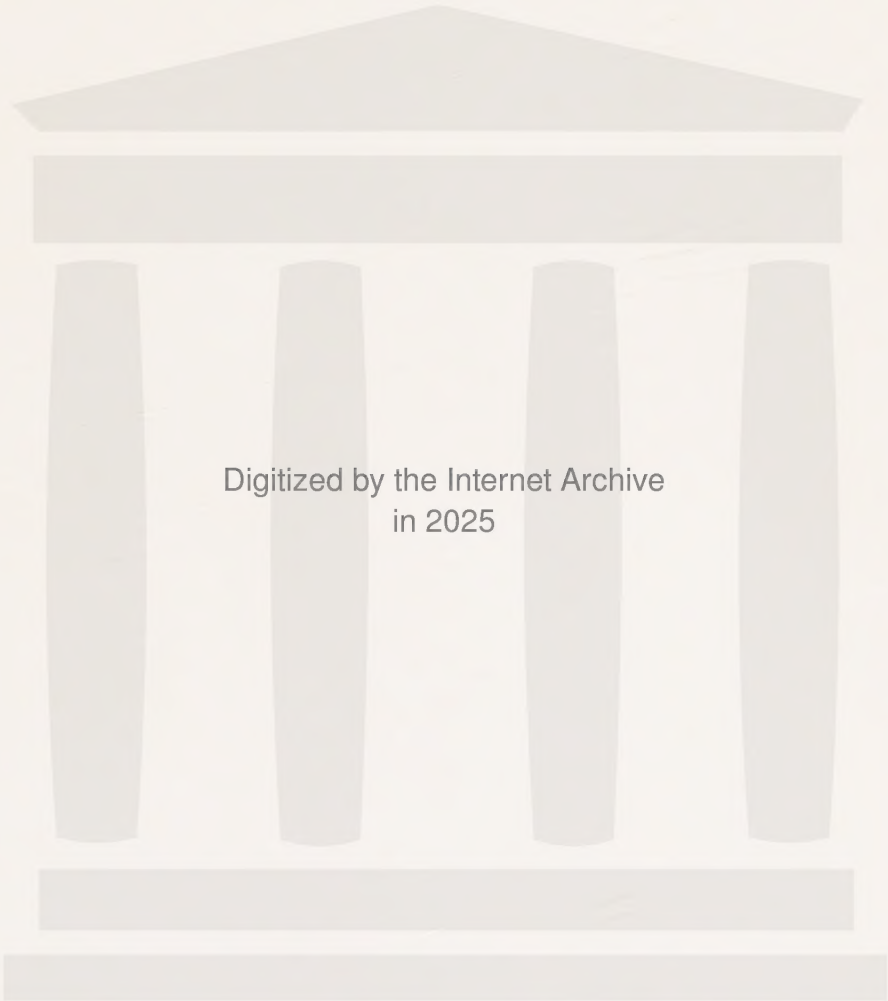
Preparation of the Beds.

When preparing beds for the propagation of trees by the etiolation method the soil should be deeply cultivated and well supplied with organic matter. At the Central Experiment Station, Serdang, trenches 2½ feet wide and 2 feet deep are dug and in filling the trenches, farmyard manure is incorporated with the soil forming a good rooting medium and supplying the plants with nutrients.

The young trees are then planted in a single row in oblique positions about 35 degrees to the horizontal and well watered. When the plants become well established, they may be pegged down in shallow trenches an inch or so below the level of the bed. Young shoots, after varying intervals according to the variety of plant, will appear on the stems and lateral branches. When the shoots are from 4—6 inches in length they are covered at their bases with 2 to 3 inches of sandy soil. As growth proceeds, a little more soil may be added until the bases of the shoots are covered to a depth of 4—5 inches.

When the bases of the shoots have etiolated or blanched, they are then in a condition to produce roots and with some fruit trees such as the lime (*Citrus medica* var. *acida*) and citron this occurs naturally. Other fruit trees such as the chiku (*Achras Sapota*), pulasan (*Nephelium mutabile*) and the orange (*Citrus Aurantium*) are more difficult and it has been found necessary to twist wire round the base of each shoot near the point where it arises from the main stem or branch. This is done to induce callus formation which stimulates root development.

When the shoots are sufficiently well rooted, they are cut from the parent stem and taken carefully from the bed, avoiding, as far as possible, damage to the roots. The rooted plants are potted into bamboo joints or earthenware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CITRON, *Citrus medica L.* A pegged-down plant showing etiolated shoots.

pots and kept under dense shade and in moist conditions until they are well rooted, when they are gradually hardened by reducing the shade. They are then ready to plant into their permanent positions in the field.

Results of Experiments.

Up to the present, experiments with this method of propagation in Malaya have only been carried on for a short time and with comparatively few species of fruit trees. The first beds were laid down at the Central Experiment Station, Serdang, in July 1932, when marcots of the chiku, a large lemon-shaped lime, and a large type of orange were prepared. These plants were pegged down and covered with soil too early, with the result that, instead of shoots appearing through the soil, the branches died back. When this was noticed the plants were uncovered. This treatment enabled both the lime and the oranges to survive, but the majority of the chiku plants died.

Later, in December 1932, additional beds were laid down with marcots of the pulasan, lime and citron, following in February 1933, by rambutan (*Nephelium lappaceum*), jambu betek (*Eugenia* sp.) and the avocado pear (*Persia gratissima*).

The early mistake of completely covering the plants was avoided. The plants were allowed time to become thoroughly established in the beds before they were pegged down and the bases were not covered until shoots had attained a length of several inches.

The lime and citron produced roots freely so that rooted plants were taken from the beds four months after planting and within a month of covering the shoot bases.

The pulasan and avocado pear produced roots fairly easily when the shoot bases were ring-wired. The chiku, however, was more difficult, but rooted shoots were obtained from the surviving plants in the first beds laid down although this did not occur until nearly a year had elapsed after planting. The same applies to the large orange. That these two fruit trees can be made to produce roots in this way is encouraging and given proper treatment it is hoped that rooted plants will be obtained in a shorter time.

The rambutan and jambu betek beds were laid down with marcots taken directly from the parent trees. This method of planting was successful for the latter, but the former were more difficult to establish and only a few survived. A few rooted shoots have been taken from the jambu betek but not, so far, from the rambutans, owing to the length of time these plants have taken to become established.

Other fruit trees which have been laid down in nurseries include the Mandarin orange (*Citrus nobilis*) and the Villa-grande lemon, but as these have been planted only a short time no results have been obtained as yet.

Conclusions.

The etiolation method of propagation has proved successful for a number of fruit trees and also for tea, and it appears possible that this method can be adopted for a number of woody plants that are difficult to propagate by other means.

The advantage of this method of propagation is that once an etiolation bed has been established, a constant supply of young plants can be obtained. To attain this end, however, care should be taken not to remove every shoot that produces roots but to leave a sufficient number for laying down in the future, so that the bed may always be well furnished with rooted plants.

The preliminary work of collecting suitable material for the laying down of beds takes time. It is unsatisfactory to put down plants which, if rooted successfully, will give planting material of unknown or inferior quality. Care should, therefore, be taken to select for this purpose only parent trees which are known to produce good quality fruits.

It is too early to state how trees propagated by this method will thrive when planted out, but there appears to be no reason why they should not behave in a similar manner to trees propagated by marcottage or cuttings.

Summary.

1. The etiolation method of propagation and the reasons for its adoption has been discussed.

2. The methods used at East Malling is given, and also some modifications which have been found expedient when applying it to tropical fruit trees in Malaya.

3. The methods adopted at the Central Experiment Station, Serdang, are given and the results, so far obtained, are discussed.

References.

1. R. G. Hatton, M.A., Director, East Malling Research Station. "Masters' Memorial Lecture, 1929—Stock and Scion Relationship", *Journal of the Royal Horticultural Society*, Vol. LV, 1930, p. 169.

2. J. N. Milsum and T. D. Marsh, "The Propagation of Tea from Etiolated Shoots", *Malayan Agricultural Journal*, July 1933, p. 310.

STORAGE OF OIL CAKES

BY

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Introductory.

In view of the importance of oil cakes and meals as ingredients of rations for feeding animals, an investigation has been carried out to ascertain the period during which such materials can be stored, using the oil content and the acidity of the extracted oil as an indicator of the storage qualities.

It is realised that the present investigation can only be regarded as preliminary as far as the general question of the storage qualities of such materials is concerned, since the experiments were confined to oil cakes and meals from local sources.

Collection and Storage of Samples.

The materials used for the investigation included the following :—

(*a*) Rice Milling By-Products
  (i) White Cargo Bran
  (ii) White Polishings
  (iii) Parboiled Cargo Bran
  (iv) Parboiled Polishings
(*b*) Coconut Cake
(*c*) Gingelly Cake
(*d*) Groundnut Cake.

Although rice milling by-products are not usually classified as oil cakes or meals, these by-products were included in the investigation, since they are often compounded with oil cakes or meals in stock rations.

As regards coconut cake, experiments were carried out with two samples of different oil content in order to ascertain whether the storage qualities of this cake as regards change of oil content and acidity of extracted oil could be correlated with the original content of the material.

The experiments with gingelly cake were also duplicated, the first sample being obtained from a wooden mill worked by bullocks, known locally as a *cheku,* while the second was taken from an iron press of a similar design to a *cheku,* but mechanically driven.

In all cases, comparatively large quantities of materials were stored; for example, sacks of rice milling by-products, in order to ensure that the amounts would be comparable with those that would be normally stored when using the materials for feeding purposes.

As regards the conditions of storage, the materials were stored in a dry shed, to which there was free access of air. Dry weather prevailed during the greater part of the period of storage.

Results of Analysis.

The results of analysis of the samples of fresh materials are shown in Table I. In addition to the figures for moisture, oil, and acidity of extracted oil, determinations of ash, crude protein and crude fibre were also made in order to collect additional data in respect of variations in composition of locally produced feeding stuffs.

The following observations are offered on the results :

(*a*) *Rice Milling By-Products.* The higher oil content of the parboiled polishings compared with the white polishings is interesting. As far as can be ascertained, this higher content is due partly to a concentration of the oil in the outer layers of the rice grain during the process of parboiling and partly to the smaller amount of polishing which this type of rice undergoes during preparation. The net result is a smaller weight of polishings of higher oil content.

In the case of the by-products from white rice, the high acidity of the oil is due to the presence in the grain of a fat-splitting enzyme (non-organised ferment) which is brought into contact with the oil during milling. This enzyme would be destroyed during the process of parboiling, thereby resulting in the oil in these by-products being much lower in acidity.

(*b*) *Coconut Cake.* The oil contents of the two samples differ by approximately 6 per cent.

In this connection, it may be pointed out that some local oil mills prefer to maintain a relatively high oil content figure, for example 15 per cent., for coconut cake. It is stated that such a cake, which feels slightly oily, finds a more ready local sale than one in which the oil content has been reduced to 10 per cent., and which is comparatively dry.

(*c*) *Gingelly Cake.* The oil contents of both samples are slightly higher than those recorded generally in literature. This is due to the lower efficiency of the *cheku* type of press compared with the modern cage-press.

(*d*) *Groundnut Cake.* The figure for the sample of groundnut cake calls for no comment.

An interesting feature of the analysis is the high protein content of the cake, which renders it useful as an ingredient for a mixed concentrate, in which it may be necessary to increase the protein content without unduly affecting the amounts of the other feeding constituents.

Results of Storage Experiments.

After a period of eight weeks, representative samples were drawn for analysis, a similar procedure being adopted after the expiry of a further period of four weeks, making a total storage period of twelve weeks.

The results of analysis, which were confined to determinations of moisture, oil and acidity of extracted oil, are shown in Table II. In order to make the results comparable, the figures for the oil contents have all been calculated on a moisture-free basis.

Except in the case of the samples of gingelly cake, the figures for the oil content indicate that, under normal conditions of storage, the decreases in this respect are small. In some cases, for example, the by-products from parboiled padi, the figures show practically no change.

Apart from the samples of by-products from parboiled padi, considerable increases in acidity of the extracted oils must be recorded in all cases. It is interesting to note, however, that the acidities show little tendency to increase during the second period of storage.

As regards the various materials the following comments are offered :—

(*a*) *Rice Milling By-Products.* The effect of parboiling on the resultant acidity of the extracted oil is clearly indicated both in the low acidity of the original oil and in the small rate of increase on storage.

(*b*) *Coconut Cake.* Although as regards oil content the storage qualities of this cake do not appear to be correlated with the original oil content of the material, the results of the acidity determinations indicate a greater increase for the cake with the higher oil content.

(*a*) *Gingelly Cake.* As regards gingelly cake, it is thought that the decrease in oil content and the marked increase in acidity can be ascribed to secondary changes resulting from the addition of sugar to the seed before pressing,* some of the sugar being retained in the cake.

The writer was informed that the objects of adding sugar were to improve the flavour of the oil, also to cause the mass to bind when pressing. From the point of view of the cake there is no doubt that the presence of sugar, which may amount to between 1 and 2 per cent., affects profoundly its storage qualities. Moulds will develop and these, in addition to increasing the acidity of the oil, may actually cause decomposition of the oil or fatty acids. Further, the rate of increase in the acidity of the oil may also be influenced by the presence in the material of various organic acids, for example, acetic acid, lactic acid and succinic acid, produced during the decomposition of the sugar.

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* Milsum, J. N. and Lambourne, J., Gingelly. *Malayan Agricultural Journal,* Vol. XXI, No. 9, September 1933, page 429.

(*d*) *Groundnut Cake.* The results of analysis indicate that, while there is a tendency for the oil content to decrease slightly on storage, the increase in acidity is not so marked as in the case of some of the other oil cakes, being comparable with that found for the sample of coconut cake with the lower oil content.

General.

Although not coming within the scope of this investigation, attention should be drawn to the fact that, after storage for 12 weeks, all the samples were infested with insects, notably *Tribolium castancum* Hbst. This insect seems particularly attracted to the rice milling by-products.

In addition to *Tribolium,* the following insects were found associated with the coconut cake, *Sylvanus advena* Walk., *Sylvanus surinamensis* L. and *Necrobia rufipes* de Geer.

The gingelly cake and the groundnut cake were the least affected by insect attack, the only insect additional to *Tribolium* being *Ephestia cautella* Wlk.

A possible explanation for the absence of insect attack in the last two cases may lie in the hardness of the cakes. Both the gingelly cake and the groundnut cake were hard in comparison with the coconut cake, which was distinctly friable and which, therefore, it would be easy for insects to penetrate.

Remarks and Conclusions.

The results of analysis indicate that, while there are only relatively small changes in the oil contents on storage, marked increases in the acidities of the extracted oils occur, except in the case of the by-products from the milling of parboiled padi.

There is no doubt that with such marked increases in acidity, both the palatability and possibly the digestibility of the materials would be affected, with the result that, for oil cakes, it would appear preferable to rely upon purchases in small quantities at frequent intervals—for example every month—rather than to attempt to store for longer periods. Further, if possible, purchases should be arranged direct with an oil mill in order that the materials may be as fresh as possible.

As regards rice milling by-products, the figures clearly show the superiority of the parboiled products over the white rice products, even though the colour of the latter, particularly the polishings, may be more attractive.

In conclusion, the writer wishes to thank the Ho Hong Oil Mills Ltd., Singapore, for supplying the samples of coconut cake and groundnut cake.

The writer is also indebted to the Entomological Division for identification of the insects and to Inche Baba bin Ludek, who was responsible for all the analytical work connected with the investigation.

Table I.

Results of Analysis of Oil Cakes and Meals.

Constituent	Rice Milling By-Products				Coconut Cake		Gingelly Cake		Groundnut Cake
	White Cargo Bran	White Polishings	Parboiled Cargo Bran	Parboiled Polishings	Sample No. 1	Sample No. 2	Sample No. 1	Sample No. 2	
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Moisture ...	9.5	9.9	8.4	7.6	11.3	11.8	14.8	18.8	7.8
Oil ...	4.1	15.1	7.0	24.7	16.3	10.3	13.7	15.1	10.9
Crude Protein ...	7.4	12.3	8.9	15.9	17.3	17.6	30.5	28.7	47.9
Crude Fibre ...	19.3	4.5	19.1	7.0	9.0	7.3	5.9	6.6	3.6
Ash ...	12.2	5.9	12.4	7.5	4.8	5.2	10.4	9.2	4.8
Nitrogen-free Extract (by difference) ...	47.5	52.3	44.2	37.3	41.3	47.8	24.7	21.6	25.0
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Oil (calculated on moisture-free basis) ...	4.5	16.8	7.6	26.7	18.4	11.7	16.0	18.6	11.8
Acidity of Oil* (calculated as oleic acid) ...	19.8	10.8	3.6	1.7	9.1	7.8	8.9	4.9	8.9

*In the case of coconut cake the acidity of the oil is calculated as lauric acid.

Table II.

Variation in Oil Content and Acidity of Oil on Storage.

Nature of Material	Period of Storage	Oil (calculated on moisture-free basis) per cent.	Acidity of Oil (calculated as oelic acid) per cent.	Remarks
White Cargo Bran ...	Fresh	4.5	19.8	
	8 weeks	4.2	43.9	
	12 weeks	3.2	40.9	
White Polishings ...	Fresh	16.8	10.8	
	8 weeks	16.9	52.6	
	12 weeks	15.6	55.3	
Parboiled Cargo Bran ...	Fresh	7.6	3.6	
	8 weeks	7.9	6.9	
	12 weeks	7.8	9.9	
Parboiled Polishings ...	Fresh	26.7	1.7	
	8 weeks	27.2	3.1	
	12 weeks	26.4	4.4	
Coconut Cake (Sample 1) ...	Fresh	18.4	9.1	Acidities of oil calculated as lauric acid.
	8 weeks	17.2	41.6	
	12 weeks	18.0	46.1	
Coconut Cake (Sample 2) ...	Fresh	11.7	7.8	Acidities of oil calculated as lauric acid.
	8 weeks	11.0	24.5	
	12 weeks	10.8	27.8	
Gingelly Cake (Sample 1) ...	Fresh	16.0	8.9	
	8 weeks	15.3	61.2	
	12 weeks	13.2	61.4	
Gingelly Cake (Sample 2) ...	Fresh	18.6	4.9	
	8 weeks	14.7	51.5	
	12 weeks	14.0	55.0	
Groundnut Cake ...	Fresh	11.8	8.9	
	8 weeks	12.1	22.8	
	12 weeks	10.0	25.4	

Abstract.

THE EXPORT-CROPS OF NETHERLANDS INDIA IN 1932.

Bulletin No. 115 of the Central Bureau of Statistics of Netherlands India.

This annual bulletin is mainly limited to a review of agricultural activity, the object of which is production for the world market. Consequently, a sharp distinction is made between produce from estates, owned and managed by foreign capitalists, and native-grown produce. Whereas the bulk of the former is grown for the purpose of export, most of the native produce—rubber excepted —is grown for local consumption. Consequently the report deals with native agriculture only in respect of excess of production, available for export after requirements for local consumption have been satisfied. This excess, in most cases, is small in relation to the requirements of a Netherlands Indies population of about 64,000,000.

Climatic conditions during the year were rather abnormal. During the first half of the year rainfall was excessive, especially in the northern half and the eastern part of Java, whereas the second half of the year was abnormally dry.

Though the volume of exports of agricultural produce remained fairly constant during the years 1928-1932, the value, owing to the world depression, declined steadily as the following figures show.

Year	1928	1929	1930	1931	1932
Gs.	1,237,000,000	1,083,000,000	832,000,000	507,000,000	385,000,000

How heavily Netherlands India has been hit by the depression is shown by the following figures for the values of all exports—mining produce and other goods included—during these 5 years. The figures do not include Government exports, such as Banka tin.

Year	1928	1929	1930	1931	1932
Gs.	1,576,000,000	1,443,000,000	1,130,000,000	747,000,000	541,000,000

Comparison of the two sets of figures also shows the preponderance of agricultural produce in the total value of Netherlands Indies exports, other than Government exports.

The very steady decline of average market prices for the usual standard grades of the principal export crops during these five years is shewn in the following table.

Average Export Prices.

	Rubber per ½ kg.	Copra per 100 kg.	Sugar per 100 kg.	Coffee Robusta per 100 kg.	Tea per ½ kg.
	cents	Gs.	Gs.	Gs.	cents
1928 average	58½	24.03	14.61	88.93	63
1929 ,,	54	21.09	13.66	89.57	57
1930 ,,	30½	18.02	9.60	52.90	46
1931 ,,	15	11.22	8.06	36.30	30
1932 ,,	8½	8.24	6.28	39.03	17½
1932 December	8½	7.61	5.91	40.07	15½

The report gives a set of 3 diagrams, showing the values of estate produce and of native produce, exported from Java, Outer Provinces and the entire Netherlands Indies respectively. These show that the export of native produce from Java is only a small fraction of the export of estate produce from these sources. Considering that the population of Java is now over 43,000,000 and that native agriculture works primarily for local consumption, this is not surprising. Only slightly over 50 per cent. of the exports from the Outer Provinces is native produce. Of the total agricultural exports of the whole of Netherlands Indies about two-thirds is estate produce. For the five years 1928/1932 the figures have been—in percentages of totals—as below:

Produce	1928	1929	1930	1931	1932
Estate ...	65.3	63.5	68.8	67.5	64.2
Native ...	34.7	36.5	31.2	32.5	35.8

Another table gives the percentages of the contribution of estate and of native produce to the values of total exports from the whole of Netherlands India. The following taken therefrom is of local interest:

Percentage of value of total exports from Estates and Native holdings respectively, 1932.

	Sugar	Cocoa	Tea	Gambier	Rubber	Coffee	Tobacco (coarse)	Kapok	Copra and oil	Pepper
Estate ...	99	76	78	62	61	38	24	8	4	1
Native ...	1	24	22	38	39	62	76	92	96	99

Corresponding figures for the four previous years do not vary materially from those of 1932.

Though the production of some crops is enormous the quantity available for export, after satisfying local demands, is very small. Figures of local interest are shown below:

	World Exports	Netherlands India Exports		
	in metric tons 1931	in metric tons 1931	in percentages of world exports	
			1931	1930
Rubber, dry ...	818,537	254,519	31	29
Sugar ...	28,477,000	2,838,737	10	11
Coffee ...	1,675,000	67,990	4	4
Tea ...	409,000	78,742	19	18
Cinchona ...	11,616	10,625	91	93
Copra Oil ...	1,449,319	367,917	25	27
Palm oil, Kernels ...	774,291	73,587	10	7
Sisal etc. ...	239,540	70,278	29	29
Cocoa ...	560,706	1,406	0.2	0.2
Kapok ...	25,697	20,602	80	79
Pepper ...	45,907	31,756	69	75

The principal crops of estate produce are: rubber, sugar-cane, coffee, tea, cinchona and oil palms. Taking the 1921 figures as a basis, the planted areas and crops have increased in volume, to the percentages given below:

	Rubber	Sugar	Coffee	Tea	Cinchona	Oil Palms	
						Oil	Kernels
Area ...	157.9	105.8	95.3	148.4	107.5	541.6	
Production ...	243.5	154.6	140.6	239.6	95.3	4,191	12,035

Excepting cinchona, the yield per unit of planted area has, in every case, increased considerably during the last 12 years. Of these crops, sugar-cane alone requires annual planting.

Of the principal crops, grown by native producers, export figures only are given, except for tea, for which the figures for the total value of purchases of native-grown leaf by the estates are given. Taking the 1921 figures as a basis, the volume—not value—has meanwhile increased to the following percentages:

Tobacco*	Kapok†	Pepper†	Copra†	Coffee§	Tea‡	Rubber*
184.2	102	120.5	131.6	239.2	382.6	1024

During these 12 years, the volume of these native crops has varied greatly. The total value of agricultural exports in 1932 amounted to Gs. 384,882,000.

The estate areas planted and in bearing for the years 1928 to 1932 are given at respectively 1,139,319; 1,165,525; 1,223,329; 1,248,013 and 1,208,546 hectares (1 hectare = 2.47 acre). For the chief crops the 1932 areas (in hectares) and the production therefrom (not including produce purchased from native growers and exported mixed with the estate produce) are as follows:

	Area in hectares		Production	
	planted	in bearing		
Rubber ...	582,196	396,747	150,898 metric tons	
Sugar-cane ...	166,138	166,138	2,560,182 „ „	
Tea ...	135,704	120,734	68,601 „ „	
Coffee ...	127,145	109,382	62,714 „ „	
Oil palms ...	70,075	43,833	90,073 „ „	Oil Kernels
Coconut palms ...	49,707	30,767	18,414 „ „ 12,284,084 nuts	Oil Kernels
Tobacco for wrappers	44,487	44,487	33,815 metric tons	

These figures do not include areas with mixed crops and the "smallholders" estates of only a few hectares each.

Cane Sugar.

An area of 6189 hectares was planted with pedigree-cane for planting material.

The estate area planted and harvested was 166,138 hectares, the native area 11,000 hectares.

The total crop of estate-grown cane was 22,369,440 metric tons. A total of 23,938 tons of native-grown cane was purchased by and milled in the factories.

The total factory-production of sugar was 2,560,182 metric tons. The crop from the native area is partly consumed in the raw state. About 77 per cent. is converted into native sugar for local consumption and export, chiefly to the

* Native exports.

† Total exports from Netherlands India less estate production.

§ Total of provincial export surplus.

‡ Purchased from native growers by estates.

Outer Provinces. The production of native sugar in 1932 was about 53,000 metric tons, of which 12,014 tons was exported from Java. The native population is increasingly using pedigree planting-material of high-yielding varieties.

Rubber.

The estate area planted is 582,196 hectares, of which 396,747 is in bearing. For the native-owned area, the figures are unknown. For the 5 years 1928-1932 the production has been in metric tons as follows:

Year	Estates	Native (dry)	Total
1928	140,928	91,353	232,281
1929	154,154	108,584	262,738
1930	153,530	90,496	244,026
1931	165,799	88,717	254,516
1932	150,901	61,447	212,348

Of the estate area, planted with rubber, 222,799 hectares are in Java, 341,459 hectares in Sumatra and 17,938 hectares in other islands. Unplanted estate reserve land is respectively 361,967; 561,908 and 65,681, totalling 989,556 hectares. Apart from this, large areas of state land would still be available outside Java.

Some rubber estates have fields with mixed crops, but of the total rubber bearing estate area, 82.9 per cent. only carries Hevea. For Java the figure is 70.2 per cent., for Sumatra 94 per cent., for the other islands 82.7 per cent. The mixed area is proportionately greatest in East Java, the secondary crop usually is coffee. In East Java there is a total of 78,591 hectares, carrying Hevea; of this area 30,736 hectares (= 39 per cent.) is unmixed and 47,855 hectares (= 61 per cent.) is the total of the Hevea-carrying parts of fields of mixed cultivation. Unmixed cultivation is, however, the rule in Sumatra and to a lesser extent also in West Java.

A table on page 84 specifies the estate areas in Java, Sumatra and other islands according to age, from which the following summary for the whole of the N.E.I. is drawn in hectares:

Year of Planting							Total	Tappable
1932	1931	1930	1929	1928	1927	Earlier		
6,912	18,182	31,650	28,520	47,356	43,781	405,795	582,196	396,747

The estate areas abandoned in Netherlands India are given below in hectares—

1927	1928	1929	1930	1931	1932
3,984	5,635	5,312	6,422	9,026	8,814

Estate rubber generally is taken into tapping in its seventh year of growth. To what extent the substitution of old fields by planting of high-yielding material has contributed to production, cannot yet be determined. This substitution has become an increasingly frequent practice during the past few years.

The tappable areas, not tapped in the course of the year, are given in absolute figures and in percentages of the total tappable area. For the whole of Netherlands India the averages were:

1st quarter	2nd quarter	3rd quarter	4th quarter	year
45,076	87,222	117,162	89,607	84,768 hectares
11.4	22	29.5	22.8	21.4 per cent.

Owing to the unevenness of cessation of tapping of part of the area in bearing it is impossible to give reliable figures of yield per area. Comparisons of the calculated figures for the periods January-June 1931 and 1932 showed an increase. This, however, may be due to the fact that the less productive fields were taken out of tapping first; that young fields in which tapping would otherwise have started remained untapped; also to a change of tapping system.

The exports of latex and concentrated latex; 90 per cent. of these exports came from the East Coast of Sumatra, which is particularly well situated for central handling of latex from the large number of adjacent estates. Exports of sprayed rubber were:

	1928	1929	1930	1931	1932
	kg.	kg.	kg.	kg.	kg.
Java	2,875,326	4,001,280	4,248,006	5,090,264	2,371,350
Sumatra	10,770,711	14,850,674	7,928,736	11,307,716	8,246,215

These amounts have been included in the export statistics quoted.

Native rubber is in Java produced in very small quantities. The area, however, is known; it is specified in a table of which the following is a summary.

	1931 planted area	1932 planted area		
		not tappable	tappable	Total
	hectares	hectares	hectares	hectares
West Java ...	5723	2795	2875	5670
Mid Java ...	308	295	55	350
East Java ...	1810	415	1809	2224
Total ...	7841	3505	4739	8244

Owing to the low rubber prices prevailing, these native fields are not tapped and are, as far as possible, being used again for planting food crops.

As a criterion of the extent of native rubber in the Outer Provinces, the export figures have had to serve primarily. A table on page 95 specifies the 1928 to 1932 exports from the various parts of Sumatra and Borneo. The following is a summary of this information in metric tons.

	Group			Total	Dry equivalent	Dry percentage
	1. dry	2. wet	3. wet			
1928	18,492	7,760	102,021	129,753	91,353	70.4
1929	24,111	6,970	114,071	145,527	108,584	74.6
1930	22,425	8,403	89,973	120,801	90,496	74.9
1931	22,940	5,473	89,719	118,132	88,717	75.1
1932	13,142	1,449	67,655	82,246	61,447	74.7

Another table gives the percentages of loss of weight on cleaning and milling of the various kinds of native rubber from Sumatra and Borneo. Native rubber can be classified in 3 main groups

Group 1: has passed through a mill, is clean and dry; loss of weight nil.

Group 2: raw, unpurified scrap and earth-rubber, wet and dirty; loss of weight in milling from 35 to 50 per cent.

Group 3: all other native rubber, moist and unclean; loss of weight in milling from 10 to 33 per cent.

Owing to the big decline of rubber prices, many native growers have stopped tapping and returned to the cultivation of foodcrops. The potential production, however, has further increased and is still increasing.

World Production of Rubber in tons of 2240 lbs.

	Production					Percentage of Grand Total				
	1928	1929	1930	1931	1932	1928	1929	1930	1931	1932
British Malaya ...	297,500	449,600	445,900	434,857	417,137	45.30	51.93	53.92	53.98	57.95
Netherlands Indies ...	228,832	258,733	240,210	250,511	209,019	34.83	29.88	29.04	31.09	29.04
Ceylon ...	56,000	80,500	75,500	61,500	49,500	8.53	9.30	9.13	7.63	6.88
British India ...	10,795	11,720	10,782	8,472	3,896	1.64	1.35	1.30	1.05	0.54
British North Borneo ...	6,799	7,381	7,115	6,247	5,379	1.04	0.85	0.86	0.78	0.75
Sarawak ...	10,750	11,313	10,310	10,451	6,960	1.64	1.31	1.25	1.30	0.97
Siam ...	2,700	2,900	3,900	2,963	2,231	0.41	0.34	0.47	0.37	0.31
French Indo-China ...	9,038	10,934	10,289	11,714	14,436	1.47	1.26	1.24	1.45	2.00
Other growers ...	4,300	5,100	2,100	3,037	2,769	0.56	0.59	0.26	0.38	0.38
Total of plantation rubber ...	627,134	838,181	806,106	789,752	711,327	95.51	96.81	97.47	98.03	98.82
Brazil ...	24,556	22,598	17,137	13,320	6,550	3.74	2.61	2.07	1.65	0.91
Other wild rubber ...	4,950	5,015	3,770	2,575	1,930	0.75	0.58	0.46	0.32	0.27
Total wild rubber ...	29,506	27,613	20,907	15,895	8,480	4.49	3.19	2.53	1.97	1.18
GRAND TOTAL ...	656,820	865,794	827,013	805,647	719,807	100				

The smaller percentage of dry rubber exported in 1932 is due to the fact that a number of small remilling factories have been closed.

The output of the small remilling factories in Sumatra and Borneo in 1928 to 1932 have been—in kilograms:

1928	1929	1930	1931	1932
12,716,865	20,343,060	18,510,749	20,837,794	11,383,675

to which the output of dry rubber, milled by the native growers, has to be added.

A table on page 99 gives the world production for the years 1928-1932, and the percentages contributed to these totals by the various producing countries.

Coffee.

The planted areas, so far as they are known, the estate-production figures and the export figures of native coffee from the Outer Provinces are as follows:—

	Planted Area—in hectares			Production—in metric tons		
	Estates	Native plantations		Estates	Native Coffee export from Outer Provinces	Total
		Java	Outer Provinces			
1928	126,762	unknown	unknown	55,314	70,635	125,949
1929	127,171	10,950	unknown	55,280	58,553	113,833
1930	130,337	15,818	unknown	40,313	54,236	94,549
1931	126,928	17,635	unknown	48,745	54,499	103,244
1932	127,145	20,578	unknown	62,715	69,958	132,673

71 per cent. of all estates are in Java; outside Java, Sumatra is the most important centre for coffee cultivation. Most estates also grow other crops, usually rubber.

The planted area is specified in a table, giving details for the year 1928-1932. For 1932 the percentage figures were:

	Planted with coffee	*With other crops*	*Reserve*
Java ...	26.1	26.5	47.4
Outer Provinces ...	17.3	13.3	69.4
Netherlands Indies ...	23.3	22	54.7

A table specifies the percentages of the production of 1928-1932, contributed by estate produce and by native produce. These averaged 37 per cent. from Java estates, 8.5 per cent. from Outer Provinces estates and 54 per cent. from native holdings in the Outer Provinces.

Nearly all the coffee estates in Java are in the eastern part. Of the total 1932 Java estate production of 51,439 tons, 46,426 tons came from East Java.

The bulk of the native coffee (mostly Robusta) is also in east Java.

Total planted area in 1932			Area in bearing in 1932		
Java	Robusta	Total	Java	Robusta	Total
2,382	18,196	20,578	1,404	11,553	12,957

In the Outer Possessions, the native growers mostly plant Robusta. From the following table, which is an extract of a fully detailed table of the exports of 1928-1932, it will be seen that about 97 per cent. of this native coffee comes from Sumatra (chiefly Palembang, Benkoelen and West Coast). The 1932 export was—in kilograms as follows :—

	Java	Liberia	Robusta	Other kinds	Unshelled	Total
Sumatra ...	1,834,786	—	64,563,746	—	4,037	66,402,569
Other Islands ...	3,015,036	5,076	534,781	—	160	3,555,053
Outer Provinces ...	4,849,822	5,076	65,098,527	—	4,197	69,957,622

The statistical figures of actual exports from Netherlands India to foreign countries do not quite tally with the known and/or calculated production figures owing to the great local consumption, accumulation of stocks and exports from old stocks.* The differences are shown in the following table.

	Known production in metric tons			Export in metric tons
	Estates	Native	Total	
1928	55,314	70,635	125,949	114,531
1929	55,280	58,553	113,833	81,814
1930	40,313	54,236	94,549	61,514
1931	48,745	54,499	103,244	68,581
1932	62,715	69,958	132,673	113,799

* Part of the native coffee, exported from the Outer Provinces to Java, is consumed there and part is stored there. From the table it is obvious that in 1932 a large part of the stocks, accumulated in previous years, must have been shipped.

In Java about 94 per cent. of the planted area is Robusta while in the Outer Provinces 90 per cent. is of this variety.

The Robusta yields per hectare in 1931 and 1932 were :—

		1931	1932
Java	...	560	740 kgs.
Outer Provinces	...	530	540 „
Netherlands India	...	550	690 „

Tea.

A table on page 123 gives summary figures for the planted areas and production in 1928-1932. It shows a gradual decline of native production of tea leaf for sale to estates and to curing factories.

	Planted area hectares		Production of dry tea. metric tons.				
	Estates	Native	Estate, including leaf, purchased from other than native growers		Native leaf, bought by estates and factories		Total
				per cent.		per cent.	
1928	115,237	34,844	57,254	78.6	15,608	21.4	72,862
1929	120,442	37,010	59,825	79.2	15,758	20.8	75,583
1930	126,996	41,202	57,628	80.0	14,363	20.0	71,991
1931	131,440	41,801	66,406	81.7	14,903	18.3	81,309
1932	135,704	39,375	69,513	84.8	12,424	15.2	81,937

Of a total of 325 estates with 135,704 hectares, planted with tea, 285 estates with 102,311 hectares are in Java—247 of which are in West Java—and 40 estates with 33,393 hectares are in Sumatra. There are 9 curing factories, purchasing and treating native-grown leaf; they are all in West Java.

On the tea estates in Netherlands India, 25.7 per cent. of the area is planted with tea, 14 per cent. with other crops and 60.3 per cent. is reserve land.

Of the 135,704 hectares, planted with tea, 120,734 hectares are in bearing, distributed over :

Java : West 84,984; Other parts 9,795.

Sumatra : East Coast 19,894; Other parts 6,061.

Total estate-area in bearing 120,734 hectares.

Information is given respecting the numbers and distribution of the estates, their areas of single or mixed planting, their production from own and from purchased native-grown leaf and on their gradual expansion. An extract is as follows : areas are in hectares.

	1928	1929	1930	1931	1932
Java ...	94,170	95,987	98,589	99,593	102,311
Sumatra ...	21,067	24,455	28,407	31,847	33,393
Netherlands India ...	115,237	120,442	126,996	131,440	135,704

This shows an increase of 8,141 hectares over the 1928 Java area in 5 years, equivalent to 8.9 per cent. and one of 12,326 hectares over the 1928 Sumatra area, equivalent to 58.5 per cent.

A table of world exports in tons is given, from which the following figures are drawn.

	1928	1929	1930	1931	1932
World ...	416,838	438,420	406,716	409,294	423,860
Netherlands India ...	69,658	72,450	72,019	78,742	78,763
Percentage ...	16.7	16.5	17.7	19.2	18.6

Tobacco.

This crop is grown and handled in various ways and the quality of the finished product differs greatly. The estates on the East Coast of Sumatra are in a class by themselves; they produce, nearly exclusively, the most expensive grade, used for cigar wrappers and they handle their own produce only.

In Mid-Java—Soerakarta and Jocjakarta—there is no native cultivation for sale of leaf to estates. All tobacco, grown for export, is grown and cured on estates.

In East Java—Besoeki—the so-called "estates" are, in fact, only curing factories. They hire the land from the native owners who are given the planting material and who grow the crop more or less in the native way under supervision, undertaking to sell the crop to the "estate" against payment on delivery. Locally this is called "estate tobacco", to distinguish it from the tobacco, grown by independent native growers, which is known as "freeman's tobacco" and in the report is classed as "purchased native-grown leaf".

Mid-Java and East Java methods of cultivation and economic arrangements are dissimilar. How much more intensive cultivation is in Mid-Java, is clear from the following figures.

1932	Soerakarta & Jocjakarta	Besoeki
estate-area ...	6,791	18,904 hectares.
production leaf-tobacco ...	11,068,846	8,333,146 kgs.

In the other tobacco-growing regions, the native growers cure their own crops and sell in the finished state to the middlemen in the trade. The figures

relating to this traffic are incomplete because the large number of Chinese and other small middlemen, who trade in the native produce, remain outside the range of statistical compilation. The native output can only be estimated and has been calculated to be in kilograms, as follows:

	Estate produce from		Total output of estates	Export	Native Tobacco
	controlled areas	native leaf purchased			
	1	2	3	4	4 less 1
1928	9,141,698	11,543,263	20,684,961	37,330,000	28,188,000
1929	9,342,790	7,860,062	17,202,852	48,802,000	39,460,000
1930	8,181,433	10,343,955	18,525,388	42,978,000	34,797,000
1931	9,818,049	12,611,143	22,429,192	45,526,000	35,708,000
1932	6,908,563	3,711,115	10,619,678	41,188,000	34,279,000

To the figures in the last column, local consumption would, of course, have to be added.

Cinchona.

The total area under this crop is 17,780 hectares. Of the 120 estates engaged in the cultivation of Cinchona, only 17 grow it as a sole crop.

The production in 1932 was—in metric tons—8,439 in Java and 1,681 in the Outer Provinces.

Oil Palms.

In 1932 there were 50 estates engaged in the cultivation of oil palms, 39 of which were in North Sumatra, and four in South Sumatra.

Areas and production are specified as follows:

Year	Estates	Planted area in hectares				Production in kgs.		Export in kgs.	
		Java	Outer Provinces	Netherlands India		Kernels	Oil	Kernels	Palm Oil and Kernel Oil
				Total	In bearing				
1928	52	472	49,852	50,324	19,033	5,767,258	27,030,137	5,731,709	28,869,735
1929	48	665	57,046	57,711	23,473	7,065,514	35,970,706	6,836,562	35,876,819
1930	48	707	60,522	61,229	30,017	9,820,548	49,751,695	9,639,066	48,014,596
1931	51	705	67,725	68,430	36,322	12,805,305	64,457,238	12,200,201	61,387,360
1932	50	710	69,365	70,075	43,833	18,413,577	90,072,649	17,884,341	84,973,111

This crop is of very small importance in Java, where it is practically entirely confined to the vicinity of Buitenzorg. In Sumatra, however, especially on the East Coast, it has attracted considerable attention. During the year 1932 only 1,640 hectares were planted.

The area in bearing (hectares) is now distributed as follows:

Java	South Sumatra	North Sumatra	Other Islands	Total
144	2,108	41,526	145	43,833

Of the total area planted, 62 per cent. only is in bearing now and so a considerable increase of output may be expected in the near future. The crop promises to become one of the chief export crops of Netherlands India.

	South Sumatra		North Sumatra	
	Mature area in hectares	Total output in kgs.	Mature area in hectares	Total output in kgs.
1928	1,263	1,927,796	17,556	24,914,899
1929	1,318	2,652,828	21,928	33,139,201
1930	1,718	2,845,121	28,013	46,766,817
1931	2,018	3,344,202	34,018	60,948,533
1932	2,018	4,413,620	41,526	85,490,469

Coconut Palms.

This is predominantly a native crop.

Most of the estates are in the Outer Provinces and most estates do not interplant other crops.

The total estate area in 1932 was, in hectares:

Java	Sumatra	Celebes and Moluccas	Other Islands	Total
6,639	11,222	27,502	4,344	49,707

Of this total area 38,293 hectares, equalling 77 per cent. is unmixed cultivation and 30,767 hectares, equalling 62 per cent. of the total area, was in bearing; from this it may be concluded that estate cultivation is comparatively new.

The estate production of copra in 1932 was 27,312 metric tons, an increase of nearly 4,000 metric tons over that of the previous year.

In addition to this, the estates buy nuts and copra from the native growers. For 1932 this amounted to 2,050 metric tons of copra.

In 1931 the palms recovered from the severe droughts of 1929 and 1930

Native Cultivation. In 1931 the palms recovered from the severe droughts of 1929 and 1930 and in 1932 too the too the climate conditions were favourable and a plentiful crop was obtained.

The surplus, available for export from native cultivation, after satisfying domestic consumption, can only be calculated by deducting from the copra export figures the import figures and the estate export figures, all reduced to copra-equivalents. This in Java gives the following figures in metric tons :—

Java	1928	1929	1930	1931	1932
native produce ...	80,113	94,773	8,854	—	77,514

In 1930 the surplus was small; in 1931 imports exceeded exports; 1932 had a considerable surplus again.

Conversion to copra-equivalents has been fixed at 4300 nuts = 1 metric ton copra

1000 litres of oil (220 gallons) = 1.5057 metric ton copra.

The exact extent of native production in Java is unknown. A large part of the copra is consumed locally in the form of oil, milled in local mills; some of this oil is exported to the Outer Possessions and to foreign countries. The report gives two tables; one calculating the quantity of copra milled by these factories, from the known export of oil cake and its estimated local consumption as a cattle-fodder; this would put the quantities of copra, milled in the factories at about—

1928	1929	1930	1931	1932
204,000	207,300	174,600	160,200	174,300

metric tons.

The other table estimates local oil consumption by deducting oil exports from factory production; according to this table, the locally consumed percentage of the oil production of the oil mills in Java was :

1928	1929	1930	1931	1932
69.5	69.5	81.4	92.5	82.3

This would show a decrease of factory oil consumption against a large increase of copra exports. With low copra prices, domestic oil production for domestic consumption increases and the very adaptable small millers in the villages in 1932 increased in numbers. Any estimate of total native production still has to disregard the copra-equivalent of the oil, milled by these village mills, and of the nuts, used for culinary purposes. There also are no reliable data as to what part of the copra, imported into Java from the Outer Provinces, is re-exported and what part is milled for the production of oil.

The quantities of copra, used by the Java oil factories, have been added to the copra exports and from this total the copra imports from the Outer Provinces and the estate exports are deducted. This balance should approximately represent native copra output in Java.

1928	1929	1930	1931	1932
222,600	241,200	153,700	138,200	223,400

metric tons.

This shows a considerable increase of production in 1932.

Outer Provinces. The following figures are abstracted from a table which gives details of the surplus, available for export—to other parts of Netherlands India and to foreign countries—from the various islands and their component parts.

	1928	1929	1930	1931	1932
Total exports ...					428,954
Estate exports ...					22,232
Native exports ...	395,405	396,781	373,866	359,930	406,722

These figures disregard local consumption of nuts.

For the whole of Netherlands India, the estate contribution to copra exports is only 6 per cent. of the total; the situation is dominated by the quantity of native produce in excess of domestic demand.

The total exports of copra alone from Netherlands India have been :—

	Java			Outer Provinces			Total Netherlands India		
	Export	Estate output	per cent.	Export	Estate output	per cent.	Export	Estate output	per cent.
1928	47,534	3,534	7.4	393,317	19,805	5.0	440,851	23,339	5.3
1929	52,858	4,171	7.9	404,011	20,306	5.0	456,869	24,477	5.4
1930	7,358	3,466	47.1	368,359	21,939	6.0	375,717	25,405	6.8
1931	3,846	3,018	78.5	356,325	20,588	5.8	360,171	23,606	6.6
1932	62,714	3,941	6.3	417,236	23,371	5.6	479,950	27,312	5.7

Converting exports of oil and of nuts into copra-equivalents, the following figures are obtained in metric tons :

	Oil : equivalent	Nut : equivalent	Copra Exports	Total
1928	55,199	13	440,851	496,063
1929	51,860	66	456,869	508,795
1930	21,246	48	375,717	400,011
1931	7,314	432	360,171	367,917
1932	27,283	423	479,950	507,656

World Production. Local consumption in the countries of production being unknown, no reliable figures can be given. The surplus, available for export, can however, be estimated. The principal exporting countries are : the Philippines, Netherlands India, British Malaya, Ceylon and Oceania.

The exports from all countries, converted into copra-equivalents, for 1928-1931 and also some incomplete 1932 figures are given in some detail, of which the following table is an extract.

	1928	1929	1930	1931	1932
Philippines ...	504,127	527,170	452,454	476,838	?
Netherlands India ...	496,063	508,795	400,011	367,917	507,656
Ceylon ...	235,844	238,225	219,697	237,385	188,396
Malaya ...	114,666	130,355	121,043	120,299	120,053
Balance of Asia ...	27,595	30,938	25,915	21,888	?
Oceania ...	175,997	205,192	200,200	185,747	?
Africa ...	50,769	51,368	54,636	55,103	?
America ...	30,094	49,624	34,642	34,155	?
Total ...	1,635,155	1,741,667	1,508,598	1,499,332 metric tons	

Essential Oils.

The only cultivated crop of any importance is citronella grass. The total planted area is : in hectares

estates Java	estates Outer Provinces	native Java	Total
9,044	284	11,179	20,507

The estates buy leaf as well as oil from the native growers and distillers. The native output of oil is unknown, owing to the very large number of small distillers and to the distilling by a great number of small growers themselves.

The total exports of citronella oil in 1932 were 996,107 kilograms, as compared with 892,895 kgs. in 1931, and an average annual export for the past 5 years of 945,336 kgs.

Hard rope Fibres.

This is an estate cultivation only, chiefly of sisal, in Java as well as in the Outer Provinces. The total exports of the last 5 years have been:

1928	1929	1930	1931	1932
50,306	58,686	65,666	70,278	90,588 metric tons.

Kapok.

This is predominantly a native crop. The cleaning of the fibre from the pods is largely a village industry. In Java there are 129 estates, cleaning their own produce and native produce purchased, and further, 83 cleaning plants, working purchased native produce only.

About 90 per cent. of the fibre and 80 per cent. of the seeds exported are native produce. All kapok seed oil and oil cakes are native produce. The 1932 exports were:

Fibre	Seeds	Oil	Oil cake
19,093	16,972	2,167	11,999 metric tons.

Netherlands India supplies 90 per cent. of the demand of the world market.

Cocoa.

The 1932 exports were 1,551 tons, of which 102 tons were native produce. The area under cultivation is slowly but steadily increasing. The quality of the product is good.

Pepper.

The cultivation is almost entirely in the hands of Chinese and native growers in Sumatra and Borneo; Java's output is negligible. Part of the exports from these two islands to Java is re-exported and part consumed locally. In 1932 these exports were: in metric tons.

		Black	White	Total
Sumatra and adjacent islands	...	17,023	13,499	30,522
Borneo	...	3,205	2,432	5,637
Celebes	...	14	—	14
		20,242	15,931	36,173

The total available world supply was 209,403 metric tons for the 5 years 1928-1932, of which Netherlands India supplied 152,160 metric tons, equal to 72.5 per cent.

Tapioca.

This crop is practically confined to Java and is predominantly a native crop. A small part of the native crop is milled in factories; the bulk of it is consumed locally and a comparatively small surplus only is exported in various forms.

Exports Tapioca Products (Metric tons).

	1928	1929	1930	1931	1932
Dried tubers ...	55,949	20,386	11,022	19,244	40,285
Dried ground ...	274,547	99,645	28,621	52,270	81,235
Flour ...	126,921	116,758	75,057	100,576	87,960
Flakes and Siftings ...	10,339	6,933	4,820	5,114	5,255
Pearl and Seed ...	26,652	19,055	10,879	14,633	11,124
Fibre-residue ...	10,222	7,507	4,626	1,257	586

The native area planted and the crops of raw tubers in these same 5 years have been:

	1928	1929	1930	1931	1932
Area in 1000 hectares ...	739	710	650	696	717
Production in 1000 tons ...	6,161	5,129	5,911	5,216	6,222*

Coca.

This is exclusively an estate crop and is exported as leaf. The production has been, in kilograms:

1928	1929	1930	1931	1932
455,677	485,407	363,000	252,085	154,101

Netherlands India is one of the chief suppliers of the world market.

Gambier.

This crop is grown in the Outer Provinces only; one quarter of the total is produced on estates and three-quarters by native and Chinese growers on

* The raw crop of 1932 having been slightly larger even than the bumper crop of 1928, the fact that 1932 exports remained far below those of 1928 is interesting and shows that in times of adversity the native population of Java can partly adjust itself to the need for economy by greater proportionate consumption of the cheaper home-grown food.— *Translator.*

the East Coast of Sumatra, Rhio and Borneo. The exports, including those to Java for native consumption have been : in metric tons.

	Estate production	Native production	Total export
1928	4,178	9,955	14,133
1929	4,342	9,317	13,659
1930	4,481	9,082	13,563
1931	3,226	10,979	14,205
1932	3,272	9,451	12,723

Arecanuts.

This is entirely a native crop. The chief exporters are Atjeh, East Coast of Sumatra and Java. An extract from the table, shewing the exports from the various parts of Netherlands India is given below in metric tons :

	1928	1929	1930	1931	1932
Achin ...	23,337	21,548	18,708	18,447	17,130
East Coast of Sumatra ...	7,548	9,057	10,896	10,018	10,066
Java ...	6,727	8,677	7,580	6,383	8,422
Other producers ...	8,346	7,407	5,412	4,337	4,144
Total ...	35,958	46,689	42,596	39,185	39,762

Nutmegs.

This information is incomplete and local consumption is unknown, but supposed to be considerable ; so that the export figures represent an unknown part of the total production. There are 15 estates in Java—mostly in Mid-Java—, 1 in Menado—North Celebes—and 10 in the Moluccas. In Java, the crop is mostly interplanted, whilst outside Java is generally a sole crop.

In Java the planted area is 1341 hectares, of which 789 hectares are in bearing. For the Outer Provinces, the figures are respectively 950 and 829 hectares. For the whole of Netherlands India this gives an area of 2291 hectares planted, of which 1618 hectares are in bearing.

In addition to the estates, there is a native cultivation, the area of which is unkown, but the output of which is known to be considerable and in Banda Island alone amounted to 818 tons of nuts and 80 tons of mace.

Cloves.

The chief centres of cultivation are Benkoelen in Sumatra and the Moluccas. The larger part of the exports from the Outer Provinces goes to Java to satisfy an astonishingly large consumption, mainly needed for the manufacture of the cheapest kind of native cigarettes.* How large this consumption is will be clear from the fact that, apart from the supplies received from the Outer Provinces, Java imports have been as follows :—

Year	1928	1929	1930	1931	1932
Metric tons	3,112	2,235	3,038	5,173	2,051

of cloves from foreign countries.

Exports from the Outer Provinces were :

	To			Total exports to Java, other Islands and foreign countries combined				
	Java	Other Islands	Foreign Countries					
	1932	1932	1932	1928	1929	1930	1931	1932
Moluccas ...	235	50	63	273	400	340	336	348
Other ...	158	36	31	1041	421	652	633	215
Total ...	**393**	**86**	**94**	**1314**	**821**	**992**	**969**	**573**

Rice.

Only a very small part of the crop is exported. The Java crop, averaging 3,600,000 tons of husked rice, is not quite sufficient to satisfy local consumption and the Java imports in 1931 and 1932 amounted to respectively 231,702 and 275,684 metric tons.

The planted areas and the production of Java have been as follows :

	1928	1929	1930	1931	1932
Area in 1000 hectares ...	3,526	3,423	3,559	3,513	3,690
Production in 1000 metric tons ...	3,483.3	3,380.6	3,652.8	3,507.3	3,713.9

* They are made from a pinch of heavily sauced and doped coarse native tobacco, wrapped in a screw of the dried leaf of which the stem of the nipah palm is composed. There is not a ranker smoke in the whole wide world !—*Translator.*

In the above figures, husked rice is taken to be half the quantity of padi "in the ear". 88 per cent. of the planted area was wet rice land and 12 per cent. dry rice land: 93 per cent. of the crop came from the former and 7 per cent. from the latter. In 1932, the bulk of the harvest was reaped in May and June.

The import requirements of Java are, to some extent, satisfied by the export surplus of the Outer Provinces, chiefly Bali and Lombok. Celebes, which has a large export surplus, exports chiefly to other islands. These other islands, especially the East Coast of Sumatra, have to import large quantities from foreign countries.

The export of rice to foreign countries has been in metric tons:

	1928	1929	1930	1931	1932
Java ...	7,649	9,312	5,241	10,413	3,214
Outer Provinces ...	1,475	1,008	765	3,996	3,704
N.E.I. ...	9,124	10,320	6,006	14,379	6,918

Maize.

This is exclusively a native crop for domestic consumption. Three-quarters of the Java crop is grown on dry land and only one-quarter on the wet rice lands.

The Java figures for planted areas, production and export have been:—

	1928	1929	1930	1931	1932
Area in 1000 hectares ...	1,886	1,727	2,025	1,962	2,002
Production in tons of grain ...	1,943,100	1,576,400	2,002,900	1,910,800	1,902,300
Export in tons of grain ...	162,782	104,695	78,807	110,999	106,304

The figures for export (metric tons) from the Outer Provinces were:

54,844 69,195 43,518 57,291 67,186

Sago.

The figures for export to foreign countries were in metric tons:

	1928	1929	1930	1931	1932
East Coast of Sumatra ...	19,952	26,975	33,697	33,917	40,084
Rhio and Dependencies ...	11,233	12,157	9,629	8,845	10,115
West Borneo ...	1,707	2,783	8,061	2,757	3,074
Celebes etc. ...	140	143	160	180	34
Total ...	33,032	42,058	51,547	45,699	53,207

Export comes from the Western part of the Archipelago only, where sago is not the chief food supply as it is in the eastern part, notably the Moluccas.

Potatoes.

Planted areas and exports were as follows:

	1928	1929	1930	1931	1932
Java area in hectares ...	20,998	19,601	17,460	17,709	23,968
Java exports—metric tons ...	3,029	2,116	1,486	1,195	2,068
Outer Provinces exports— „	4,838	5,668	4,835	2,517	2,886
Total exports ...	7,867	7,784	6,321	3,712	4,954

Chillies.

In the Outer Provinces, this crop for export is of no importance. In Java, it is of some importance and the crop is chiefly planted on dry rice land; 72 per cent. against 28 per cent. on wet rice fields. From the latter, the crop is harvested in December, from the former in August.

Cotton.

Exports to foreign countries were in metric tons:

	1928	1929	1930	1931	1932
Java ...	647	543	558	974	485
Outer Provinces ...	938	1,036	820	706	746
Netherlands India ...	1,585	1,579	1,378	1,680	1,231

Practically the entire Java export is cleaned of seeds, and practically the entire export from the Outer Provinces is uncleaned.

L. A. J. R.

Conversion Table.

1 hectare = 2.471 acres. 1 kilogram = 2.2026 lbs.
1 metric ton = 1000 kilograms. 1 Eng. lb. = 0.454 kilogram.
1 English ton = 2240 lbs. = 1016 kilograms.
Yield: 1000 kgs. per hectare = 891⅓ lbs. per acre.

Miscellaneous Articles.

CONDITIONS ON SMALL RUBBER HOLDINGS IN MALAYA.

4th Quarter 1933

Prepared by the Economics Branch of the Department of Agriculture, S.S. and F.M.S. in collaboration with the Field Branch of the Department of Agriculture.

Rainfall.

In Perak the total rainfall for the quarter was very slightly below average, but the monthly totals showed variation from the average. October's precipitation was appreciably below the average whilst it was slightly above average for both November and December. In October the rainfall was fairly evenly distributed throughout the month, but the distribution was irregular in both November and December. The rainfall in Selangor was below the average in all districts during October and November, especially in the coastal districts, whilst in the inland districts during December, rainfall was slightly above average. Wet weather prevailed throughout the quarter in Province Wellesley, Penang and Dindings, the heaviest rainfall occurring in October when 35.83 inches were recorded in Penang.

On the east side of the Peninsula, the north-east monsoon had not broken at the end of November, although its influence was felt in the north-western area.

Prices.

Table I included in this article, shows the range of prices for the 4th quarter 1933, the Singapore average price for small-holders' rubber having remained fairly steady since August. The peak price for the year was secured in July when Singapore Standard Sheet sold for 14 11/16 cents per lb. and the small-holders' rubber averaged $17.50 per picul.

There was a decrease in price for all grades during August, September and October but the price firmed during November and December.

The quotations in the Table show the ruling prices from a large number of buying centres and it should be noted that such factors as transport and local competition affect the prices secured by the small-holder for his rubber.

The following Table shows the trend of average prices ruling in Singapore per picul at the end of each month for Kampong rubber during the year 1933.

Table I.

Rubber Prices [in Straits dollars per picul (133⅓ lbs.)]

4th Quarter, 1933.

	Singapore standard sheet Average	Singapore for small holder's rubber at end of month	Penang for small holder's rubber	Perak	Selangor	Negri Sembilan	Pahang	Malacca	Province Wellesley	Kedah	Johore
					OCTOBER						
Smoked sheet.	17.25	15.50	—	10.50-15.90	13.00-16.50	12.80-15.75	10.50-17.00	13.00-16.00	13.50-16.00	12.50-15.50	10.00-16.20
Unsmoked sheet.		14.50	12.60-14.40	9.00-13.50	12.-0015.50	10.00-13 50	9.00-15.00	10.00-15.00	12.80-15.00	10.50-12.80	7.50-14.25
Scrap		5.00	5.20-6.50	1.00-5.50	3.00-6.00	2.00-5.50	—	3.00-6.00	4.-006.50	3.50-7.00	1.80-6.00
					NOVEMBER						
Smoked sheet	17.51	16.50	—	11.50-15.80	14.00-17.00	12.00-16.50	12.00-16.00	13.00-16.00	13.00-18.00	13.00-15.20	10.00-16.20
Unsmoked sheet		15.00	12.00-14.20	10.00-14.30	12 00-14.50	10.00-14.00	10.50-14.80	11.00-14.50	11.00-17.00	10.00-13.50	7.50-14.50
Scrap		5.00	5.50-6.50	1.80-6.20	3.00-6.50	2.00-6.00	—	3.50-7.00	2.85-6.50	3.50-6.50	1.80-7.10
					DECEMBER						
Smoked sheet.	18.08	16.50	—	13.00-17.00	14.00-17.95	13.00-17.00	12.00-17.00	14.00-17.00	12.00-16.50	12.50-16.50	12.00-17.00
Unsmoked sheet.		15.50	13.50-14.60	10.50-14.25	12.00-14.50	10.00-15.00	10.00-15.00	12.00-16.50	10.00-15.00	10.00-13.60	8.00-15.60
Scrap		5.50	5.00-6.20	2.75-6.00	3.00-6.00	2.50-5.00	—	3.50-8.00	3.00-6.00	4.00-6.50	1.50-6.50

Table II.

Average Singapore Prices for Rubber 1933.

	Smoked Sheet $	Unsmoked Sheet $	Scrap $
January ...	8.00	7.00	3.20
February ...	7.50	6.70	2.40
March ...	7.60	6.80	2.50
April ...	7.80	6.80	2.70
May ...	11.80	11.00	5.00
June ...	13.50	12.25	5.00
July ...	17.50	16.00	7.00
August ...	15.00	14.00	6.00
September ...	15.00	14.00	5.50
October ...	15.50	14.50	5.00
November ...	16.50	15.00	5.00
December ...	16.50	15.50	5.50

Tapping.

Reports from Penang state that, as compared with last quarter, tapping is on the increase, some holdings having started tapping twice daily, i.e. morning and evening and that there is a small increase in the total number of holdings, due to young holdings in the Dindings being newly brought into tapping; similar reports of young rubber being brought into tapping have been received from Pahang.

In the Krian and Selama districts of Perak, much of the tapping on small-holdings was done on the half-share system, tapping being usually on two or more panels.

Tapping in Malacca continued to be heavy owing to the prevailing good prices for rubber and the increase in the number of tapped holdings continued.

Areas out of Tapping on Small Holdings.

The method of estimating the area untapped among small-holdings by means of counting the number of such holdings along the sides of main roads was again employed, the result of this computation is shewn in Table III and was applied to the known area of tappable rubber, 1927 planting and earlier.

The total area of tappable rubber on estates of less than 100 acres which was untapped in the Federated Malay States in December 1933 is estimated on the foregoing system as amounting to approximately 45,000 acres as compared with 49,000 acres in September, 56,000 acres in June and 133,000 acres in March of this year.

The total area untapped in the Straits Settlements in December is estimated to be 14,000 acres as compared with 17,500 acres in September, 28,000 acres in June and 49,000 in March of this year.

Diseases.

Mouldy Rot.—In Penang and Province Wellesley North, mouldy-rot was prevalent towards the end of November and it was suggested that this outbreak might be connected in some way with movements of labour due to the present high prices of rubber.

The disease continued to be prevalent in all of the four western districts of Pahang, whilst no improvement was recorded in the position regarding the control of mouldy-rot in Perak, the response to efforts made to sell disinfectants being still very small. In Selangor there was a slight increase of mouldy rot infection during the quarter as a result of wet weather conditions and it was stated that control treatment was fairly well carried out, whilst in the Negri Sembilan the rainy season was responsible for a widespread distribution of the disease.

Pink Disease.—Some cases of this disease occurred in Province Wellesley and control measures were at once taken.

Root Disease.—It was reported that root diseases were fairly widely distributed throughout small holdings in Pahang, but that they did not result in any material damage.

Oidium Leaf Disease.—No reports were received in regard to this disease.

Grades of Rubber Made.

Figures of the percentages of the various grades of rubber produced, where these have been recorded, are as follows:—

PERAK: *Kuala Kangsar*:—(figures from 6 dealers) smoked sheet 32, unsmoked sheet 42, scrap 26.
Larut and Matang:—Smoked sheet 6, unsmoked sheet 70, scrap 23 and Lump 1.
Selama:—smoked sheet 80, unsmoked sheet 15, slab rubber and scrap 5.

PENANG and PROVINCE WELLESLEY: (figures from 26 dealers) smoked sheet 16, unsmoked sheet 70, scrap 14.

SELANGOR: *Kuala Langat*: smoked sheet 75, scrap 25.
Klang: smoked sheet 70, scrap 30.
Kuala Langat: smoked sheet 71, scrap 29.
Ulu Langat: smoked sheet 79, unsmoked sheet 8, scrap 13.
Ulu Selangor: smoked sheet 89, scrap 11.

MALACCA: *Central*: smoked sheet 29, unsmoked sheet 51, scrap 20.
Alor Gajah: unsmoked sheet 81, scrap 19.
Jasin: smoked sheet 21, unsmoked sheet 62, scrap 17.

Table III.

Estimated Acreage of Tappable Rubber which was out of Tapping on Holdings of less than 100 Acres, at the end of December, 1933.

PERAK				SELANGOR				NEGRI SEMBILAN				PAHANG			
District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage
Batang Padang	37,288	1,000	3	Klang	18,879	4,000	21	Seremban	19,241	2,000	10	Raub	7,361	1,500	20
Kinta	34,180	2,000	6	Kuala Langat	29,263	2,000	7	Tampin	17,947	2,000	11	Kuala Lipis	15,951	1,000	6
Kuala Kangsar	43,485	1,000	2	Ulu Langat	38,867	6,000	15	Kuala Pilah	17,470	3,000	17	Bentong	13,600	1,500	11
Upper Perak	13,774	1,500	11	Ulu Selangor	30,632	1,000	3	Jelebu	6,270	250	4	Other Districts	31,223	3,000	10
Larut & Selama	51,407	5,000	10	Kuala Lumpur	21,174	3,500†	11†	Port Dickson	10,653	1,000	9				
Krian	9,751	2,000	21	Kuala Selangor	9,379										
Lower Perak	47,937	1,000*	2*												
	237,822	13,500	6		148,194	16,500	11		71,581	8,250	12		68,135	7,000	10

MALACCA				PENANG & P. WELLESLEY				SINGAPORE			
District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage
Central	17,687	2,000	11	North	3,241	100	3	Singapore	12,781	2,000	15
Alor Gajah	31,387	8,000	25	Central	7,067	200	3				
Jasin	24,971	250	1	South	8,149	—					
				Dindings	7,279	1,000	14				
				Penang	11,114	500	4				
	74,045	10,250	14		36,850	1,800	5		12,781	2,000	15

The percentage of areas out of tapping in September, 1933, was as follows:—Perak 8, Selangor 8, the Negri Sembilan 16, Pahang 12, Malacca 15, Penang and Province Wellesley 9, Singapore 24.

* Estimated from same percentage as shown in Kuala Kangsar District.

† Estimated from mean percentage for remainder of State.

THE MALAYAN PINEAPPLE TRADE IN CANADA.*

Growth of Malayan Trade.

The Malayan canned pineapple trade in Canada has increased by 35.5 per cent. during the past five years, in 1932, 81.3 per cent. of the total imports of canned pineapples in that country being from the Straits Settlements. This increase has been mainly at the expense of the United States of America and Hawaii, whose combined imports into Canada have during the same period, decreased by 36.8 per cent. This situation is partly the outcome of the Ottawa Conference, whereby Empire produce is subject to an import duty of one cent (gold) per lb., as against five cents per lb. levied on the product from non-Empire countries.

On the other hand, the exports of pineapples from Malaya to Canada during 1932 amounted to only 85,000 cases, as compared with 219,000 cases in 1931, so that the reduced import evidently lay in the offtake of canned pineapples in general. The total imports of canned pineapples into Canada from all sources was 16,677,579 lbs. in 1932, 24,159,734 lbs. in 1931, 20,520,478 lbs. in 1930, 19,674,205 lbs. in 1929 and 15,054,834 lbs. in 1928.

Provisional figures for the first few months of 1933 seem to indicate a very considerable increase in imports, as well as a further developments in Malaya's relative share.

Position of Malayan Pineapples.

The Publicity Officer from the Malayan Information Agency took occasion to visit a large number of chain stores in Toronto, Ottawa and Montreal, and in each of these cities he found a different state of affairs. The one common feature was the absence of American and Hawaiian pineapples, which seem to have been virtually driven off the market.

In Toronto, the demand for canned pineapples seemed to be concentrated very largely on the "luxury" grades and, although there was a good demand for the Malayan product at about 11 cents (gold) per tin, there was an even better demand for Queensland pineapples at from 15 to 20 cents a tin. The possible explanation is that the poorer classes of Ontario have not yet learned to look upon pineapples as an article within their means.

In Ottawa, the public demand was divided between "luxury" and "cheap" with the preponderance, if any, in favour of the latter. Malayan pineapple was reported to enjoy a steady demand.

In Montreal, however, Malayan pineapples seemed to all intents and purposes to have a monopoly. Little or nothing else was to be seen in the shop windows, and the store-keepers asserted that the "luxury" trade was practically non-existent.

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* Abridged from the Report on the participation of Malaya at the Canadian National Exhibition, Toronto 1933, by the Publicity Officer of the Malayan Information Agency, London.

Relative Prices.

Special Sliced Malayan pineapple in 1½ lb. "talls" is shipped to Canada at present at an approximate price (c.i.f.) of 2s. 10½d. per dozen tins labelled, for minimum carloads of 500 cases and this is a considerably lower rate than that at which the product of any other country can be put on the market.

To arrive at an average retail price, however, is extremely difficult; in one store they were marked at two cans for 25 cents, in another at 10 cents a can and in a third it was 9 cents a can or three for 25 cents. The explanation was that the store first cited was temporarily short of pineapple stock and wanted to "mark time" with sales, while the third store was making a special "feature" of cheap pineapples in order to attract customers.

Graded Pineapple.

This commodity was brought to the attention of various distributors' representatives and also to a large number of retailers and store-keepers. All those who saw the graded pineapple were very impressed by its even colour and good appearance generally. None the less, they were unanimous in declaring that there is no place for it on the Canadian market if the certificate of grading involves any increase in price.

Crushed Pineapple.

The market for this commodity does not appear to have been explored nearly so fully as it deserves, and the demand is now likely to increase as the result of the Malayan participation at this Exhibition.

Several store-keepers stated that they had been approached for Malayan crushed pineapple but had been unable to supply it—had hitherto been unaware, in fact, of its existence. This is a matter which no doubt will soon be adjusted.

One distributor was of opinion that the rather higher cost of crushed pineapple will be likely to operate against its wide popularisation, though this might not be an insuperable obstacle if the public became genuinely interested. He was also of opinion that it would be necessary to have an absolutely distinctive label; also that the word "grated" must be eliminated and the grade simply termed as "crushed", which is the term used in the case of the Hawaiian and Australian products.

Pineapples in Cubes.

This commodity is practically unobtainable from Canadian stores, but there would appear to be a not inconsiderable potential demand. The opinion has been expressed in one quarter that the demand for cubes will never be strong enough to overcome the handicap of the higher price for this packing.

Pie-Fillings.

The Malayan representative at the Canadian National Exhibition was approached by a firm who for some time past has done a considerable business in the importation of frozen fruits for pie-fillings.

It appears that the firm applies to this business a special patent process. The peculiar value of this process, it is claimed, lies in the fact that the frozen fruit will remain good for a lengthy period after being removed from cold storage.

The firm is anxious to add crushed pineapple to the list of pie-fillings which it imports, but has been prevented hitherto by the high price of Hawaiian fruit. Ordinary canned crushed pineapple is unsuitable; it has too high a liquid content. It is thought, however, that a good volume of business could be developed by the application of the process to crushed pineapple in Malaya, and the firm in question would be willing to explain it to a reliable firm if satisfactory arrangements could be made.

Conclusion.

The conclusion would seem to be that there will definitely be room for expansion of the market in Canada for low-priced foodstuffs such as Malayan canned pineapple; while to this it should be added that the Malayan fruit, provided it continues its present improvement in respect of quality, flavour and grading, ought to be able also to secure at least some share of the "luxury" trade.

INTERNATIONAL GROCERS' EXHIBITION, 1933.*

The Exhibition was held at the Royal Agricultural Hall, Islington from September 16th to 23rd.

Once again, a comprehensive display of Malayan canned pineapples was rendered possible by the co-operation of various importing firms who provided free samples of this product. In addition to pineapples, exceptionally good samples of tapioca were on view and attracted favourable notice.

This being purely a trade show, propaganda was aimed primarily at the retail grocer, as opposed to the consumer. With Malaya already providing almost 94 per cent. of the canned pineapple annually imported in to the United Kingdom, it is self-evident that little scope remains for the expansion of Malaya's proportionate share of the market. It is a recognised principle of advertising, however, that a commodity must continue to be kept before the public attention

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* Abstract from a report by H. S. Banner, Publicity Officer, Malayan Information Agency, London.

however firmly it may seem to be established. Moreover, such exhibitions as this provide an opportunity for demonstrating that Malayan pineapple is making steady advancement in regard to quality, flavour and grading.

The quality of pineapple supplied for this Exhibition was the best sample of the product handled during the writer's experience extending over the past six years. Such improvement must be maintained if we are to keep the enviable place on the market which we have won.

As the position is at present, the retailer has learned that it definitely pays to stock Malayan pineapples. One buyer who visited the stand—a man who deals in 2,000 case lots—stated that he had first commenced to stock the Malayan product, in place of that of a competing country, after its introduction to his notice at this same exhibition two years ago. His trade has increased by 100 per cent. since he took this step.

The volume of new business brought about through the agency of the Malayan Stand naturally grows less each successive year—"naturally", because of Malaya's almost monopolistic position on the market at the present time. Nevertheless, a fair number of new connections for medium-sized lots were effected.

Reviews.

Malayan Agricultural Statistics, 1932.

By D. H. Grist. Special Bulletin, Department of Agriculture, S.S. and F.M.S., Economic Series No. 3. 74 tables, 2 graphs. 1933. Price 50 cents.

This Bulletin contains statistical data concerning Malayan agriculture and brings up to-date, the information published in Bulletin No. 1 of the Economic Series of this Department respecting the year 1931.

It is compiled by the Economic Branch and in the course of its preparation, use has been made of data compiled by other Departments of Government, notably the Customs, Statistics and Veterinary Departments, and the Meteorological Branch of the Survey Department.

The present edition is considerably larger than the previous edition. It contains 11 additional tables, while a number of footnotes have been added which further explain the figures and give information respecting the more important countries of import and export.

The bulletin attempts to present a statistical review, over a number of years, of Malayan agricultural industries and trade. It not only shews the developments that have taken place, but demonstrates the local market which exists for products suitable for cultivation in Malaya, but of which large quantities are imported.

In addition, statistical information is given of areas and distribution of crops in Malaya, yields and market prices.

The M.A.H.A. Magazine.

The M.A.H.A. Magazine, published monthly, is the official organ of the Malayan Agri-Horticultural Association and the Selangor Gardening Society. The January number (Vol. IV, No. 1) contains a number of articles of interest to those to whom gardening is a hobby and also to a wider public who are engaged in various aspects of agriculture. The original articles included in this number are on Hedges; Insect Pests of Ornamental Plants; New or Interesting Ornamental Plants; The Control of Rural Malaria; Rainfall Recording; and Milk Production in the Tropics and the Value of Pasteurisation.

The Magazine costs 36 cents post free, or $1.20 per annum and is good value for the money. Subscriptions should be addressed to the Editor, M.A.H.A., 12 Barrack Road, Kuala Lumpur.

Departmental.

FROM THE DISTRICTS.

The Weather.

The month was characterised by an unusual period of wet weather, giving a rainfall much above the average in all parts of the Peninsula except in the States of Kedah and Kelantan and a few other localities including Cameron Highlands. The wet period occurred generally during the first fifteen days to three weeks of the month; but in Krian and Larut Districts of Perak and on Cameron Highlands the middle ten days constituted the wet period. While Krian and Larut Districts experienced a heavy rainfall, minor floods occurred in Pahang and more severe floods in Johore and Singapore Island. Strong North-East Monsoon winds were prevalent.

Remarks on Crops.

Rubber.—The average price of rubber rose as a result of the increasing possibility that a restriction scheme would, before long, materialise. The highest and lowest prices in dollars and cents per picul recorded during the month for rubber from small holdings were :—Smoked Sheet $12.50 to $19.50; Unsmoked Sheet $10 to $18; Scrap $1.50 to $7.25. The average Singapore prices for these grades were respectively $19, $17.50 and $6 as compared with $16.50. $15.50 and $5.50 in December. Penang prices for Unsmoked Sheet ranged from $13.50 to $16.50 as compared with $13.30 to $14.60 in December.

Two opposing tendencies were manifest during the month. On the one hand, the increase in the price of rubber and the need of ready money for the expenses of the Mohamedan New Year festivities tended to increase production, through further additions to the number of properties in tapping and by the wider use of somewhat severe tapping methods. On the other hand, wet weather, padi harvest, and the incidence of part of the fasting month with the following new year celebrations, tended to reduce production by restricting tapping, while the commencement of wintering and high winds in the dry weather at the close of the month reduced the yield of rubber from the trees tapped.

In Kelantan, the movement towards improving the quality of the rubber produced on small holdings is extending.

Padi.—The price of padi at the Government Rice Mill, Bagan Serai, was fixed at $1.50 per picul, a fall of 12 cents per picul as compared with that of December. This reduction is in sympathy with the prevailing low price in the world's markets. The price at this mill was, however, better than that offered by private millers in Kedah, where it varied from $1.10 to $1.15, or in Penang Settlement, where it was $1.25 per picul. In other parts of the country, the price has ranged from 5 to 15 cents per gantang in the villages, the most usual prices being 5 to 9 cents.

Harvest was in full progress in Kedah, Penang and Province Wellesley, Krian and Malacca where yields so far obtained have been good. Except in

Kedah, high winds and rain caused rather extensive lodging; on the whole, however, yields did not suffer, though in Malacca the quality of some of the grain was affected by the wet weather.

In the later planted areas in Larut, Kuala Kangsar and Upper Perak Districts of Perak the rain improved the crop, but in the Kuala Pilah District of Negri Sembilan floods did some damage.

In Kelantan, a good crop of dry padi was harvested, but the wet padi crop is likely to be poor.

Coconuts and Copra.—The price of copra remained very low at $2.20 to $2.40 in Penang and $1 to $3 per picul elsewhere.

While Malays continued to show interest in the preparation of improved copra, more especially in Province Wellesley, Krian and Johore, there was little definite progress to record during the month.

Pineapples.—Comparatively little canning was done in Johore and Singapore during the month owing to the scarcity and consequent high price of fresh fruits which sold at prices up to $3 per 100 fruits of first quality. This is a high figure in proportion to the present low price obtainable for the canned product.

The reduction in supply is mainly attributed to reduction of the area planted as a catch crop without a compensating increase in the area planted as a sole crop. It is considered, however, that a reduced yield from areas of older plants grown without manuring and also, possibly, the climate during the present season are contributing causes.

Fruit.—Fairly heavy crops of the main tree fruits were obtained in the Bentong District of Pahang, but only small crops in Kuala Lipis District. In the Negri Sembilan and Singapore Island, the season was drawing to a close. In Kedah, large supplies of water melon were on sale in the local markets.

Tobacco.—Prices for sundried tobacco leaves have ranged from $14 to $40 for first quality and $8 to $20 per picul for second quality in most areas. In parts of Johore the price for first quality leaf was as high as $65 per picul, while in Province Wellesley the top price was only $22 per picul. There was a tendency to reduce the planted area in Province Wellesley, Malacca and Selangor. In the Province, food crops are being substituted for tobacco, while in Malacca, Chinese padi and vegetable growers are using chillies in preference to tobacco as an inter-season crop.

Further flue curing trials at the Pineapple Experiment Station in Singapore during the month resulted in the production of a leaf of good colour, but of poor quality. The leaves were mainly obtained from untopped plants grown for seed and were, in consequence, small and thin, though comparatively easy to cure effectively. After harvesting the leaves yellowed naturally in one to one and a half days and the fixing and drying processes occupied only a further two days. The proportion of yellow leaf obtained was very satisfactory.

Arecanuts.—While in most parts of the Peninsula the price of dried arecanuts remained very low, it was somewhat better in Malacca, where a revival of interest and a fairly brisk trade in nuts was reported.

In interesting minor industry exists in the Muar District of Johore. Chinese from Kelantan and Trengganu visit this District in the cropping season and prepare salted arecanuts for export to Hong Kong and Shanghai and thence to the interior of China. The Chinese buy the ripe fruit and pack it with salt into large baskets holding about 1½ piculs. The fruits are well rammed down and the baskets are then shipped to Singapore for export to China. At the end of the season, the Chinese return to the North East coast where the arecanuts ripen later than in Johore.

Vegetables.—Preparation of the land for the cultivation of vegetables was proceeding in many parts of Kelantan. As a new development, some plots of vegetables will be planted in the padi fields of Pasir Puteh District after the padi harvest. In Singapore Island, considerable damage was done by floods to many of the vegetable-growing areas during the first half of the month; in some localities practically a total loss of the growing vegetables was recorded.

Agricultural Stations.

The various experiments with tea at the Government Experiment Station, Tanah Rata, have not been in progress long enough to give reliable results, but it may be mentioned that the first records from manurial experiments with various fertilisers indicate that an adequate supply of nitrogen is the most important factor in maintaining the vigour and yield of the bushes. The analysis of the first year's records from an experiment on pruning intervals for mature tea indicates an interval of at least 3½ years between prunings may be allowed and that manuring is advantageous when tea is kept in bearing for this period.

A second break of 68 half chests of tea was ready for despatch to England early in February.

The fowls recently imported from England for this Station have given a large number of eggs, varying according to breed from an average of 19 to 23 per pullet for the month. Of these eggs, 52 per cent. were over 2 ozs. each and 48 per cent. between 1½ and 2 ozs.

At the Central Experiment Station in Kelantan, the plots of the manurial experiment with dry padi were harvested. In spite of difficulties resulting from wet weather and damage from rats sheltering under the lodged crop, good yields, averaging over 340 gantangs per acre, were obtained.

Padi Test Plots.

Harvesting of manurial and other experiments was completed at the Padi Test Plots at Langgar, Jitra and Rantau Panjang in Kedah. At the first two Plots there were some excellent plot yields. Stores of the local type (Malay: kepok) were erected for padi seed for distribution at Langgar and Jitra at small

cost. Harvest was also in progress at the Kuala Kurau Padi Test Plot in Krian, where lodging had resulted from the strong winds and rains experienced about the middle of the month. Notwithstanding this, crops were good, those reaped averaging about 600 gantangs per acre.

Harvest was also completed at the Tangkak, Labis and Segamat Padi Test Plots in Johore. At the first two Plots the pure strains of padi ripened before the local varieties both on the Plots and in the surrounding padi fields. Consequently they suffered severely from the attacks of birds. The local varieties gave yields of about 500 gantangs per acre as compared with 200 to 240 gantangs per acre from the damaged pure strains. At the Segamat Plot, Siam 29 and Siam 76 yielded at the rate of 300 gantangs per acre as compared with 210 and 180 gantangs per acre respectively from the local Serendah Kuning and Serendah Puteh.

Rural Lecture Caravan.

The Caravan visited four centres in Ulu Selangor District during the month, staying two days at each. Lectures illustrated by models and lantern slides were given on housing and care of poultry. Large audiences attended and showed much interest in the lectures.

NOTE.

Manuring of Sugar Cane in British Guiana.

In the introduction to Part I of the series of articles on studies of Malayan soils which appeared in the August 1933 number of this Journal, a statement was made concerning sugar cane soils in Demerara.

In a recent letter to the Director of Agriculture, S.S. and F.M.S., Professor J. Sydney Dash, Director of Agriculture. British Giuana writes as follows:—

> "I do not think British Guiana is ever likely to use pen manure and her yields have steadily increased during the last three years by nearly a ton of sugar per acre due to increased tillage, increased use of flood fallowing and increased use of commercial fertilisers".

It may be pointed out that in the article in question there was no intention of suggesting that British Guiana was likely to be in a position to use pen manure. the situation in that country presumably being, in certain respects, parallel with Malaya where it may be regarded as practically certain that the extensive use of pen manure is, from the nature of conditions, hardly likely ever to become generalised.

The effect of flood fallowing as practised in Demerara as part of procedure for restoring soil fertility seems to be a point of particular interest.

H. A. T.

DEPARTMENTAL NOTES.

Visits and Tours.

On January 19th and 20th the Director of Agriculture visited the Negri Sembilan and Malacca where he inspected the Agricultural Stations and discussed various questions with the Agricultural Officers. He also conferred with the Resident Councillor, Malacca.

From January 20th to 29th the Director of Agriculture paid an official visit to Johore, at the request of the Government of the State, for the purpose of inspecting the agricultural services and of reporting to the Johore Government on measures to be adopted for their extension. During the period the Director conferred with the General Adviser and with Assistant Advisers and Agricultural Officers and visited all districts throughout the State.

On January 22nd the Director of Agriculture attended a meeting of the Executive Council in Singapore for the purpose of discussing questions relating to the rice industry in the Straits Settlements with His Excellency the Governor and members of the Council.

The Chief Field Officer paid a visit to Singapore on January 19th to see the packing of a trial consignment of graded canned pineapples and inspect the Pineapple Experiment Station.

The Acting Agricultural Chemist paid a visit to Oil Palm Plantations Ltd., Johore, on 21st to 23rd January.

The Assistant Chemist for Copra Research visited Bagan Datoh, Perak and Sabak Bernam, Selangor, on 15th and 16th of the month to give advice concerning the reconstruction of kilns on a coconut estate and to survey the conditions of copra manufacture on small holdings.

Central Experiment Station.

From January 1st 1934, the Government Experimental Plantation, Serdang will be known as the Central Experiment Station, Serdang.

Appointment.

Mr. N. H. Sands has been appointed Acting Agricultural Officer, Perak Central. He assumed duty on January 8th 1934.

Leave.

Mr. H. D. Leighton, Agricultural Officer, has been granted full pay leave for 4 months, 15 days with effect from January 8th., on expiry of agreement.

Statistical.

MARKET PRICES

January 1934.

Rubber.—The market price of rubber has fluctuated during the month, opening at 13⅜ cents per lb. for Spot loose in Singapore and closing at 15⅞ cents per lb. The average price for the month was 14½ cents per lb. in Singapore, 4 13/32 pence in London and 9⅛ cents Gold in New York as compared with 13 9/16 cents, 4 3/16 pence and 8 11/16 cents Gold respectively in December 1933.

Palm Oil.—The course of the market Liverpool/Continent during January on a basis of 5 per cent. f.f.a., c.i.f. was as follows: January 3rd £15 per ton net, January 17th £14 per ton net, and January 24th £14 per ton net.

Prices in the U.S.A. landed weight per pound in bulk c.i.f. New York/Philadelphia were 2.65 cents Gold on the 3rd January, 2.70 cents Gold on 17th January and 2.60 cents Gold on the 24th January.

The price of palm kernels Fair Average Malayan Quality c.i.f. landed weight on the Continent was shillings 7/4½ per cwt. on January 3rd.; shillings 7/3 per cwt. on January 17th. and shillings 7/3 per cwt. on January 24th.

Copra.—There was a further slight fall in price during January. The highest Singapore price for Sundried during the month was $3 per picul, and the lowest price $2.90 per picul, the average price per picul being $2.94 as compared with $3.08 during December. The mixed quality averaged $2.29 per picul as compared with $2.40 per picul in December.

Coffee.—The price at Singapore for Sourabaya coffee remained fairly steady, prices ranged according to grade, from $17 to $19. Palembang Coffee averaged $13.12 per picul during the month, being quoted at $13.50 on the 1st. and a similar price on the 26th; the average figure for December was $12.25.

Arecanuts.—Palembangs averaged $2.94 per picul and Bila Whole $5.75 per picul as compared with $1.96 and $2 per picul during December, the rise in price being very considerable. The range of Singapore prices for other grades was Split $2.25 to $4 per picul; Sliced $6 to $7.50 per picul and Kelantan $3 to $4.50 per picul.

Rice.—The average wholesale price of Siam No. 2 ordinary rice per picul in Singapore in December was $3.18 per picul as compared with $3.31 in November. No. 1 Rangoon rice averaged $3.11 per picul in Singapore in December, the average price for November being $3.10 per picul.

The average retail market prices in cents per gantang of No. 2 Siam rice in December were:—Singapore 23, Penang 26, and Malacca 24 as compared with 24, 27 and 27 respectively in November.

Tea.—During December the average price quoted in London for Malayan tea was shillings 1/1.86. Average prices during December for tea consign-

ments from other countries were as follows:—Ceylon, shillings 1/3.32; Java, pence 11.16; Indian Northern, shillings 1/1.61 and Indian Southern, shillings 1/1.86.

Gambier.—The price of Block gambier remained steady during January, averaging $3.85 per picul, Cube No. 1 averaged $6.35. Corresponding figures for December were $4 and $6.50 respectively.

Pineapples.—There was a further slight increase in value during January, the average Singapore price per case being as follows:—Cubes $3.17, Sliced Flat $3.05 and Sliced Tall $3.13, as compared with $3.14, $3.04 and $3.10 respectively during December.

Tapioca.—The price of Flake Fair averaged $4.85 per picul as compared with $4.45 in December. Pearl Seed averaged $5.60 per picul and Pearl Medium $6 per picul both slight increases on the average prices in December, namely $5.42 and $5.70.

Sago.—Pearl-small Fair again increased slightly in price during January, averaging $3.94 per picul during the month; the price was $3.90 in December. Flour-Sarawak Fair averaged $1.92 per picul as compared with the December average of $1.79 per picul.

Mace.—Prices were nominal during January, the average for the month for Siouw being $65 per picul and $40 for Amboina.

Nutmegs.—100's averaged in price during January $20 per picul, having averaged $19.60 per picul during the previous month; 80's again fell in value, averaging $23.60 per picul, against the figure of $24.40 per picul in December.

Pepper.—Average Singapore prices during January were as follows:—Singapore Black $15.30 per picul; Singapore White $30.50 per picul and Muntok White $32.60; the corresponding figures for December were $13.30, $22.60 and $23.60 per picul respectively.

Cloves.—There was a further fall in the average price of Zanzibar during January as compared with the December price; the January average was $35 per picul. Amboina continued steady as in the previous months at $45 per picul. These are nominal prices.

Tuba Root.—Prices are again firm. Good Rotenone-containing roots averaged $30.50 per picul, while good qualities on the Ether extract basis averaged $24.00.

The above prices are based on London and Singapore daily quotations for rubber; on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports are kindly supplied by Messrs. Guthrie & Co., Ltd., Kuala Lumpur; the Singapore prices for coffee and arecanuts by the Lianqui Trading Company of Singapore, and tuba prices by Messrs. Mackie & Co., Singapore.

1 picul = 133⅓ lbs. The Dollar is fixed at two shillings and four pence.

Note.—The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Charing Cross, London, S.W.1.

GENERAL RICE SUMMARY.*

December, 1933.

Malaya.—Gross foreign imports of rice (including stocks available for re-export) during December 1933, amounted to 49,168 tons as compared with 57,402 tons in December 1932, of which 46 per cent. were consigned to Singapore, 18 per cent. to Penang, 9 per cent. to Malacca, 23 per cent. to the Federated Malay States and 4 per cent. to the Unfederated Malay States.

Of these imports, 63 per cent. were from Siam, 24 per cent. from Burma, 9 per cent. from Indo-China and 4 per cent. from other countries.

Total foreign exports of rice from Malaya in December 1933, were 10,579 tons (including 115 tons local production) as compared with 17,876 tons in December 1932.

Of these exports 69 per cent. were consigned to Netherlands India and 31 per cent. to other countries.

Net imports for the period January to December 1933, were 433,956 tons as compared with 409,631 tons during the same period for 1932, an increase of 5.9 per cent.

India and Burma.—Total foreign exports of rice during November 1933, were 103,000 tons as compared with 91,000 tons in the previous month and 100,000 tons in November 1932, an increase of 12 per cent. in respect of the previous month and an increase of 3 per cent. in respect of the same period in the previous year.

Total exports during the period January to November 1933, were 1,758,000 tons as compared with 1,966,000 tons for the corresponding period of 1932, a decrease of 11 per cent.

Siam.—The area under padi at the end of November, 1933, in Siam was 7,542,400 acres as compared with 7,457,200 acres in the previous season. The area damaged was 428,000 acres. The total production was 4,790,100 tons. The surplus available for export is now estimated at 1,641,000 tons of rice and rice products.

Netherlands India, Java and Madura.—At the end of November 1933, the area harvested amounted to 9,096,000 acres an increase of 171,000 acres or 2 per cent. as compared with the corresponding date of 1932; the area damaged was 446,000 acres an increase of 85,000 acres or 24 per cent. as compared with 1932, and additional plantings awaiting harvesting amounted to 2,070,000 acres an increase of 278,000 acres, or 16 per cent. The total acreage at the end of November 1933, amounted to 11,612,000 acres, an increase of 534,000 acres or 5 per cent. as compared with the same period in 1932.

Imports of rice into Java and Madura during January to October 1933, totalled 104,465 tons, a decrease of 17,779 tons or 14 per cent., as compared with the same period of 1932.

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*Abridged from the Rice Summary for December 1933 compiled by the Department of Statistics, S.S. and F.M.S.

Imports of rice into the Outer Provinces during January to October 1933, amounted to 211,201 tons, a decrease of 8,488 tons or 4 per cent., as compared with the same period of 1932.

French Indo-China.—Entries of padi at the port of Cholon from January to December, amounted to 1,086,000 (metric) tons, a decrease of 27,000 tons or 2 per cent. as compared with the same period of 1932.

Exports of rice from Saigon for the period January to December 1933, totalled 1,221,000 tons, an increase of 29,000 tons or 2 per cent. as compared with the corresponding period of 1932.

Ceylon.—Imports for the period January to November 1933, totalled 398,996 tons, a decrease of 471 tons on the imports for the same period of 1932.

Of these imports 19 per cent. were from British India, and 89 per cent. from other countries.

Europe and America.—Quantities of rice shipped from the East were :—

(*a*) To Europe for the period January 1st to December 20th, 1,233,493 tons, an increase of 223,238 tons or 22 per cent. as compared with the same period of 1932. Of these shipments 46 per cent. were from Burma, 2 per cent. from Japan, 44 per cent. from Saigon, 7 per cent. from Siam and 1 per cent. from Bengal as compared with 52 per cent. from Burma, 2 per cent. from Japan, 38 per cent. from Saigon, 5 per cent. from Siam and 3 per cent. from Bengal in 1932.

(*b*) To the Levant, period January 1st to November 18th 1933, 23,993 tons a fall of 24,069 tons or 50 per cent. as compared with the same period of 1932.

(*c*) To America and the West Indies for the period January 1st to November 26th 1933, 157,543 tons an increase of 39,177 tons or 33 per cent. as compared with the same period of 1932.

MALAYAN PRODUCTION OF PALM OIL AND KERNELS FOURTH QUARTER, 1933.

(As declared by Estates).

	Palm Oil		Palm Kernels	
	F.M.S.	Johore	F.M.S.	Johore
	Tons	Tons	Tons	Tons
1933 October ...	896.0	331.6	154.0	61.0
November ...	851.2	291.8	143.0	50.8
December ...	887.5	225.0	157.5	37.5
Ttotal ...	2634.7	848.4	454.5	149.3

MALAYAN AGRICULTURAL EXPORTS, DECEMBER, 1933.

	Net Export in Tons.			
	December 1932	December 1933	Year 1932	Year 1933
Arecanuts ...	1,731	670	20,288	20,756
Coconuts fresh† ...	11,610	6,507	109,536	100,609
Coconut oil ...	1,281	1,419	11,949	17,568
Copra ...	6,768	13,577	97,277	110,543
Gambier, all kinds ...	172	266	2,926	2,560
Palm kernels ...	150	170	1,248	1,983
Palm oil ...	592	1,635	7,892	12,101
Pineapples, canned ...	6,231	5,242	66,291	59,582
Rubber§ ...	40,974	45,205	417,137	459,836
Sago,— flour ...	974	1,614	8,994	7,648
„ — pearl ...	176	369	3,156	2,646
„ — raw ...	315*	503*	4,199*	4,420*
Tapioca,— flake ...	682	696	9,028	9,881
„ — flour ...	284	332*	393	702*
„ — pearl ...	1,409	1,050	19,879	17,297
Tuba root ...	39½	71½	167	569½

† hundred in number. § production. * net imports.

ACREAGES OF TAPPABLE RUBBER NOT TAPPED ON ESTATES OF 100 ACRES AND OVER, FOR THE MONTH ENDING DECEMBER, 1933

STATE OR TERRITORY	Acreage of Tappable Rubber end 1932	ESTATES WHICH HAVE ENTIRELY CEASED TAPPING		ESTATES WHICH HAVE PARTLY CEASED TAPPING		Total (3) + (5)	Percentage of (7) to (2)
		Acreage	Percentage of (3) to (2)	Acreage	Percentage of (5) to (2)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
STRAITS SETTLEMENTS :—							
Province Wellesley	44,734	1,323	3.0	7,317	16.4	8,640	19.4
Dindings	6,969	209	3.0	759	10.9	968	13.9,
Malacca	111,780	4,642	4.2	16,881	15.1	21,523	19.3
Penang Island	1,635	626	38.3	100	6.1	726	44.4
Singapore Island	28,269	9,484	33.5	4,919	17.4	14,403	50.9
Total S.S. ...	193,387	16,284	8.4	29,976	15.5	46,260	23.9
FEDERATED MALAY STATES :—							
Perak	250,951	4,398	1.8	34,156	13.6	38,554	15.4
Selangor	308,379	6,490	2.1	40,549	13.2	47,039	15.3
Negri Sembilan	228,541	7,510	3.3	20,505	9.0	28,015	12.3
Pahang	38,141	5,892	15.4	6,293	16.5	12,185	31.9
Total F.M.S. ...	826,012	24,290	2.9	101,503	12.3	125,793	15.2
UNFEDERATED MALAY STATES :—							
Johore	325,747	21,711	6.7	32,912	10.1	54,623	16.8
Kedah (*a*)	114,551	3,784	3.3	7,370	6.4	11,154	9.7
Kelantan	21,175	6,237	29.5	2,227	10.5	8,464	40.0
Trengganu (*b*)	4,352	Nil	Nil	1,561	35.9	1,561	35.9
Perlis (*a*)	957	177	18.5	468	48.9	645	67.4
Total U.M.S. ...	466,782	31,909	6.8	44,538	9.5	76,447	16.4
TOTAL MALAYA ...	1,486,181	72,483	4.9	176,017	11.8	248,500	16.7

Notes :— (*a*) Registered companies only and are rendered quarterly.

(*b*) Registered companies only.

The above table together with a Summary, was prepared and published by the Statistics Department, S.S. and F.M.S. in January, 1934.

STOCKS, PRODUCTION, IMPORTS AND EXPORTS OF RUBBER, INCLUDING LATEX, CONCENTRATED LATEX AND REVERTEX, FOR THE MONTH OF DECEMBER 1933 IN DRY TONS.

Territory	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports				Exports including re-exports				Stocks at end of month		
								during the month		January to Oct 1933		during the month		January to Dec. 1933				
	Ports	Dealers	Estates of 100 acres and over	during the month	January to Dec. 1933	during the month	January to Dec. 1933	Foreign	From Malay States & Labuan	Foreign	From Malay States & Labuan	Foreign	Local	Foreign	Local	Ports	Dealers	Estates of 100 acres and over
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
MALAY STATES :—																		
Federated Malay States ...	...	12,983	11,958	12,926	137,363	11,030	110,828	Nil	Nil	Nil	Nil	18,179	5,255	180,004	70,546	...	12,715	12,728
Johore ...	...	3,196	3,244	4,324	44,237	4,748	53,065	Nil	3	Nil	124	1,631	7,397	17,101	79,840	...	3,305	3,182
Kedah ...	...	506	2,234	2,294	28,682	3,698	18,910	Nil	Nil	Nil	Nil	1,655	3,338	15,487	31,634	...	538	3,201
Perlis ...	...	21	14	16	108	45	213	Nil	Nil	Nil	Nil	Nil	53	Nil	323	...	28	15
Kelantan ...	...	309	188	196	2,225	251	6,074	79	Nil	1,128	Nil	68	537	976	8,314	...	215	203
Trengganu ...	...	55	50	90	1,638	45	818	Nil	Nil	Nil	Nil	Nil	135	Nil	2,456	..	55	50
Total Malay States	...	17,070	17,688	19,846	214,253	19,817	189,928	79	3	1,128	124	21,533	16,715	213,568	193,113	...	16,856	19,379
STRAITS SETTLEMENTS :-																		
Malacca ...	...	2,943	1,285	1,561	16,338			Nil		15		3,929		48,884		...	2,734	1,293
Province Wellesley	...	1,307	588	629	6,366			Nil		Nil						...	1,067	602
Dindings ...	...	53	202	122	1,223	3,933	30,711	Nil	16,829	Nil	193,892	8,544	Nil	80,608	Nil	...	59	154
Penang ...	3,995	5,764	9	14	73			1,957		11,380						2,354	5,465	8
Singapore ...	2,542	31,662	123	190	1,851			11,734		115,191		23,573		230,352		5,955	31,110	149
Total Straits Settlements	6,537	41,729	2,207	2,516	25,851	3,933	30,711	13,691	16,829	126,586	193,892	36,046	Nil	359,844	Nil	8,309	40,435	2,206
TOTAL MALAYA	6,537	58,799	19,895	22,362	240,104	23,750	220,639	13,770	16,832	127,714	194,016	57,579	16,715	573,412	193,113	8,309	57,291	21,585

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber	Federated Malay States	S'pore	Penang	Province We'sly D'dings M'cca.	Johore	Kedah
20	21	22	23	24	25	26
DRY RUBBER	9,227	26,458	4,467	3,706	1,290	165
WET RUBBER	3,488	4,652	998	154	2,015	373
TOTAL ...	12,715	31,110	5,465	3,860	3,305	538

TABLE III
FOREIGN EXPORTS

PORTS	For month	January to Dec. inc. 1933
Singapore ...	35,522	353,663
Penang ...	14,048	130,818
Port Swettenham.	7,298	77,199
Malacca ...	711	11,732
MALAYA ...	57,579	573,412

TABLE IV
DOMESTIC EXPORTS 4

AREA	For month	during the year 1933
Malay States ...	43,271	448,690
Straits Settlements		
MALAYA ...	43,271	448,690

Notes :—1. Stocks on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained.

2. The production of estates of less than 100 acres is estimated from the formula : Production + Imports + Stocks at beginning of month = Exports + Stocks at end of month, + Consumption, *i.e.*, Column [7] = Columns [13] + [14] + [17] + [18] + [19] + 20 tons local consumption during the month — [2] — [3] — [4] — [5] — [9] — [10]. For the Straits Settlements, Columns [9] and [10] represent purchases by dealers from local estates of less than 100 acres, reduced by 15 % to terms of dry rubber.

3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15; wet sheet, 25 ; scrap, lump, etc., 40%; stocks elsewhere are in dry weights as reported by the dealers themselves.

4. Domestic exports are estimated by deducting the average monthly dry weight of foreign imports over a period of 2 months from the gross foreign exports of the later month, the foreign exports of the Malay States being domestic production.

5 The above, with certain omissions, is the Report published by the Registrar-General of Statistics, S.S. and F.M.S., at Singapore on 23rd January 1934.

METEOROLOGICAL SUMMARY, MALAYA, DECEMBER, 1933.

Locality	Air Temperature in degrees Fahrenheit							Earth Temperature		Rainfall								Bright Sunhine		
	Means of			Absolute Extremes						Total		Most in a day	Number of days					Total	Daily Mean	Per cent
	A. Max.	B. Min.	Mean of A and B	Highest Max.	Lowest Min.	Lowest Max.	Highest Min.	At 1 foot	At 4 feet			Amt.	Precipitation .01 in or more	Precipitation, .04 in or more	Thunder-storm	Fog morning obs.	Gale force 8 or more			
	°F	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.								
Railway Hill, Kuala Lumpur, Selangor ...	88.6	70.8	79.7	92	68	82	73	82.5	83.7	13.56	344.4	2.25	22	19	4	11		152.15	4.91	41
Bukit Jeram, Selangor ...	86.5	71.6	79.0	89	70	80	74	82.1	84.2	7.04	178.8	2.46	17	15	1		1	153.20	4.94	41
Sitiawan, Perak ...	86.6	71.3	78.9	91	67	78	74	82.2	84.0	6.08	154.4	3.00	16	14	1	1		142.95	4.61	39
Temerloh, Pahang ...	84.8	72.0	78.4	88	69	78	74	82.3	84.4	8.33	211.6	1.86	21	15		1		129.40	4.17	35
Kuala Lipis, Pahang ...	83.9	70.8	77.3	89	69	77	73	81.3	82.9	5.72	145.3	1.97	23	19		23		110.30	3.56	30
Kuala Pahang, Pahang ...	82.1	72.9	77.5	85	70	76	75	79.5	81.7	21.65	549.9	5.33	24	22				135.55	4.37	37
Mount Faber, Singapore ...	84.7	71.5	78.1	89	69	80	73	79.1	80.6	4.49	114.1	0.84	18	14	1			136.65	4.41	36
Butterworth, Province Wellesley ...	86.1	72.4	79.3	89	70	83	74	82.8	84.0	4.35	110.5	1.85	9	9	1	2		180.15	5.81	49
Bukit China, Malacca ...	84.4	72.5	78.5	87	71	78	74	80.6	82.0	9.02	229.1	3.06	15	12	2			151.00	4.87	41
Kluang, Johore ...	84.9	71.0	77.9	89	69	74	73	79.9	81.2	7.35	186.7	2.18	17	15		4		129.55	4.18	34
Bukit Lalang, Mersing, Johore	81.8	71.6	76.7	85	69	77	73	78.7	79.9	9.96	253.0	2.08	21	18		2		132.65	4.28	
Alor Star, Kedah ...	87.0	70.8	78.9	91	67	79	74	82.9	84.3	4.18	106.2	1.84	14	9	2			176.10	5.68	48
Kota Bahru, Kelantan ...	82.9	72.1	77.5	87	69	77	74	80.3	82.1	29.14	740.2	5.88	19	18				131.80	4.25	36
Kuala Trengganu, Trengganu	82.0	71.7	76.9	85	70	73	74	78.7	79.7	30.27	768.9	6.89	24	20		1		127.85	4.12	35
HILL STATIONS.																				
Fraser's Hill, Pahang 4268 ft. Pahang ...	69.9	60.3	65.1	74	58	62	62	70.2	71.1	9.90	251.5	3.23	24	22		21		82.85	2.67	23
Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	70.1	54.2	62.1	73	48	65	62	68.0	69.1	6.08	154.4	1.48	18	15		1		102.95	3.32	28
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	69.6	57.9	63.7	73	55	65	60			6.87	174.51	1.44	19	16		2		109.20	3.52	29

Compiled from Returns supplied by the Meteorological Branch, Malaya